Arboriculture,
Dist. and Canal,
Punjab,
Report
1878-79 to 1883-84

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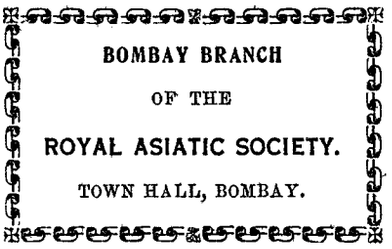

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DISTRICT AND CANAL ARBORICULTURE REPORT, 1878-79.

Punjab

1. It is unfortunate that a report on Arboriculture for the official year 1878 should appear in September 1879, but I feel that an apology is hardly called for in this office, seeing that I have no means of altering the fact, that local reports are sent to me most irregularly, in spite of an early reminder to all districts issued in the hope that it would be possible to submit this report as an appendix to the Forest Administration Report, which was submitted in the print more than two months ago.

2. The districts of Hazára, Kohát, Bannu and Dera Ismail Khan have sent no reports at all. Indeed this is usually the case.

The canal reports have been all received, with the exception of the 1st Division Bári Doáb canal.

Recommendations to districts.

3. I have added to each district (where needed) a specific paragraph margined "recommendations," as the remarks suggested by the local report.

4. Some general remarks are suggested by the perusal of the local report.

Pruning and lopping should be restricted as much as possible. Skilled supervision is not attainable as a rule; therefore it is certain that all lopping and pruning that can be possibly avoided should be so, and no temptation to get a little revenue by lopping should be given way to.

Pruning and lopping should be restricted.

If revenue of this kind is wanted, it is far better to plant close and thin. Close planting will draw up the trees, and so get their heads out of the way of cart traffic, &c. It will also prevent blanks, since if a tree fails here and there it is of no consequence. The poles that come out of an avenue thinned the 3rd or 4th year (according to growth) will usually be saleable for native house building; in any case they will furnish material for fencing.

5. Never remove very large branches, rather cut off a few feet at the end, and so shorten them. Wherever a branch is broken, or wherever a branch has to be cut, cut it close to the stem. *Never* leave a stump 2 feet or so long. Always cut from below first, and then downwards, so that the weight of the branch does not tear down a strip of bark, but comes clear away.

The season of pruning is not easy to determine. It must be done at a time when the growth of the tree is vigorous, so that the wounds may close over quickly; it must not be done when the sap is in full flow, or the wound will "bleed" profusely. As inspection is much more likely to follow, I should recommend autumn.

6. It should always be noted what *income* of any kind has been realized to set off against the cost of operation. Some districts have suggested that there is some income, but have not stated it.

Income to be noted.

Fencing.

7. The subject of fencing, whether round each tree or in a line continuously, should be noted; the form of fence and the cost are both useful to note, as affording a hint to other districts.

Contents of reports.

8. The year's operations on the whole show an improvement in method, and nearly all the reports are very much more satisfactory than any that have preceded them.

Establishments.

9. A very great diversity of practice, and still greater diversity as regards the amount spent, appears under the head of establishment.

It may be suggested that this subject should receive consideration in each district.

One plan appears to be to have a fairly well paid "darogah," or head man over the whole, and a number of jamadárs and peons, or "guards" to watch the groves, plantations, gardens and avenues.

In other places the tahsíl establishments supervise, and there are gardeners, with assistant coolies and bhistis permanently entertained.

In many districts no regular men are kept on, but gardeners, coolies and bhistís are entertained as occasion requires as "daily labor."

Whether one "daroga" can really inspect each tahsíl's work is a matter I cannot decide, but if such a man is kept, or if a special man in each tahsíl is kept, I would suggest their being sent for 6 months or so to Chánga Mánga to be taught. I strongly urge the *permanent* organization of a sufficient number of "gardeners" or "tree-planters," who should know their work, and get familiar with local methods of planting. This establishment should be reasonable, and should supervise all work being done under their orders by daily labor. To each gardener one assistant on smaller pay might be allowed.

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10. The arboriculture statements are not yet quite as uniform as might be wished. They ought not to be bulky, and I think that, to diminish labor, instead of giving a list of roads, I would simply give tahsíl totals of roads, and then specify localities of groves, gardens or plantations, where possible.

Statements not yet uniformly prepared

11. In order to simplify the returns and to reduce the labor of preparation, I propose in future to *drop the three columns* "success" "partial success" and "failure," and simply to use one column for "going over or replenishing previous," and one for "new work." The amount of success is then briefly noted opposite the work in the column of remarks. Thus, "of gaps filled on 4 miles about 50 per cent. succeeded," or "gaps filled on 2 miles, all but a few died owing to drought, &c., &c."

Proposed simplification.

12. I have drawn up and appended to this report, once more, a sample statement (the names and facts being of course imaginary), and I think that each district will have no difficultty in giving its return *uniformly* in this shape.

13. May I once again point out the *absolute* uselessness of alluding generally to *eucalyptus;* the *second* name is the important one; and too great care cannot be used in labelling pots, seed, beds and young plants. There are 160 eucalypti inhabiting every style of climate, from snowy mountains to dry and arid plains. If one species *succeeds*, and we do not know which of the 160 it is (and we can only do this by having the *second* name), how can we ever extend the cultivation, or apply for the proper seed?

Cultivation of eucalyptus.

(PATTERN.)

SIALKOT DISTRICT.

Tahsil.	Serial No.	Locality or name of road.	No. of miles still unplanted or planted but failed altogether.	Work of previous year which still requires completion.	*Work of the year under report.* Going over or completing old work.	*Work of the year under report.* New work.	Remarks.
Zafarwál—dry—rain-fall 20·5′	1	Length of road to be operated on during year, 16 miles.	...	The whole to be replenished.	8 miles	...	Shisham trees all died on one mile from drought.
				I.—Roads.			
Pasrúr ...	2	Do. 108 miles	7	108 miles, a few blanks only.	108 miles	4 miles	The new work was with pípal seedlings, and bór cuttings; the latter on 2 miles failed to strike.
				II.—Groves and Gardens.			
Do. ...	3	8 groves or groups of trees.	about 16 acres.	In all some trees existed but room for extension.	700 trees	...	Chiefly mango added at the tahsil, on 3 groves, on encamping grounds, on the main road to Amritsar, the school-house, the dispensary and the police rest-house.
	4	Plantation ...	25 acres.	Blank.	...	25 acres.	A plot of waste land near the Amritsar road was taken in hand, ploughed in lines, 2 feet broad at 10 feet apart, and sown with kikar and phuláhi in alternate lines in the begining of the rains, has come up well, as at date of report (1st June 1879) the seedlings were sufficient to cover the area; success may be reported.

N. B.—(Detail of roads not wanted—only totals of length, any road of particular inportance or treated in a moral or interesting manner, may be noted in the "remarks" or in the narrative).

NARRATIVE NOTE.

The method of work was entirely by transplants one year old (about 3 feet high), except where 4 feet bór cuttings were used.

A central nursery for each tahsíl is maintained, and several temporary ones at convenient sites on the Amritsar road.

In the Siálkot station garden, besides a nursery for trees, fruit trees of superior kinds are cultivated. In 1871, 4 European (French) olive trees were received. They were planted out in rich soil, and have since been pruned and manured. They are now 20 feet high and 18 inches in girth. They fruited, one tree abundantly this year, and the other sparsely. 203 oranges and 50 fig trees, 20 palm and 30 Palampur peaches were sold at cost price, and in some cases given to zamíndárs.

Expenditure amounted to Rs. 4,000, thus—

Establishment.		Rs.	
1 Darogah	...	25	
1 Jamadár	...	7	
4 Peons	...	5	
1 Gardener	...	7	Rs. 576
1 Do. assistant	...	4	
	Total	48	
Cost of 155 bhistis and 104 coolies	...	...	„ 2,500
Carriage of plants	...	...	„ 204
Cost of bullocks	...	...	„ 500
Contingencies	...	...	„ 220
		Total Rs.	4,000

Young trees are fenced, either with thorns, which cost nothing, or mud palisades which cost 6 annas each, wooden crates in the station cost 12 annas each, being made out of thinnings.

Lopping only when necessary is executed with a saw and English knives.

PESHAWAR DISTRICT.

14. This district is classed as dry, the rain-fall being—

Pesháwar	...	...	20·7 inches
Mardán	...	...	24·9 „
Hashtnagar	...	...	19·8 „
Doaba Daúdzai	...	...	21·0 „

It is found that March (for spring work) and August (for rain work) are the best months for transplanting. In a district so far north, March, which would be very late in other places, is probably very well suited. The object in all early spring transplanting, is to get the trees well settled *before* the spring growth begins, so as to give the plants the full benefit of it.

15. The trees found to succeed best for groves and road-side work are the shisham, the mulberry, the sirin (*acacia lebbek*,—I presume the common tree, not the white or "Doon," siris is intended), the babul (*acacia vera*) and the willow. The "gaz*" (probably the *tamarix articulata*) has been also used. Efforts have been made to grow the kikar (*acacia Arabica*), but I think that though this may be successful as a curiosity, it will be found that Pesháwar is too far north.

Gujrat and Jhelum are the limits of its successful growth, speaking generally.

Expenditure.

16. The expenditure was as follows:—

1 Jamadár	@ Rs. 12 and 4 @ Rs. 10	... ...	Rs. 624
3 Malís	@ „ 9, 8 & 7 each	... ...	„ 288
4 Do.	@ „ 6 ...	... ...	„ 288
91 Coolies	@ „ 5 (for 11 months)	... ...	„ 5,005
Temporary Malís	„ ...	... ...	„ 44
95 Coolies	@ „ 5 (for one month)...	... ...	„ 475
Nurseries	... ...	... ...	„ 243
Wells	... ...	... ...	„ 160
Water-courses for do.	... ...	... ...	„ 148
	Total	...	7,275

The expenditure reported last year was Rs. 11,300.

The establishment has been reduced.

Summary of operations.

17. The usual table of work accompanies, and is summarized in the table at the end, which is intended to give the totals as far as possible of the whole Province.

Recommendations.

18. It may generally be observed that the plan is a good one always to *complete* and have done with, one road or one section of a road before beginning a new one.

* NOTE. "Ghaz" or Ghazlei is given by Brandis as a name for the smaller tamarisk—*T. dioica*. I would not cultivate this small species,—the large tamarisk or farash of the plains is the only one worth planting.

Pruning it is said is done in August. I take this opportunity most strongly to recommend this being done as little as possible, and especially that no *mulberry** tree be ever pruned at all; unless to remove a branch broken by accident. Bad pruning of all trees is sure to end in a decayed stem, but of mulberry trees before all.

The Jhil plantation.

19. The Jhil plantation had an income as follows:—

Balance on 1st April		Rs 912
Grant on indent from Imperial Forest Budget		„ 1,136
Total ...		Rs. 2,048

And the expenditure was—

Establishment.—

1 Jamadár @ ...	Rs. 10	
1 Malí @ ...	„ 8	Rs. 696
8 Coolies @ ...	„ 5	
Excavation of drain cuts		„ 700
Huts for gardeners		„ 100
Cost of "massaks"		„ 21
Total		Rs. 1,517

The Revenue from grass sales was Rs. 1,458-8-6.

The work on the plantation.

20. I have during the year fully explained what is wanted, and promised the visit of a Forest Officer in spring next when work can go on. But this Jhil plantation never can be finished, and never can be successful, till the drainage is complete, and this involves the definite settlement of certain disputes with the neighbouring land-owners. This has been explained in great detail to the local authorities, and I pointed out that it will be of no sort of use sending a Forest Officer there until this point is settled, being one with which a Forest Officer has no power to deal. I have not been favoured with any reply to my letter.

21. The plantation has been finished as far as it is at present possible, which simply means that all the compartments not yet drained, in consequence of the disputes alluded to, have failed, and of course will continue to be failures till the drainage is carried out by the settlement of the disputes.

HAZARA
KOHAT
DERA ISMAIL KHAN
BANNU
} *No report.*

DERA GHAZI KHAN DISTRICT.

21. The work has been properly confined to a few places. I make no apology for repeating this remark; it is the secret of economical success—undertake a small extent of work and finish it "out and out" before going on to another piece.

Destruction by floods.

22. The terrible floods of last year did so much damage that every thing attempted in the year under report has been in the way of restoration. Mr. Fryer says that it will take two or three years to complete this restoration.

Summary of work.

23. The road planting may be summarized here as showing what the floods did. From Dera Gházi Khan to Rájanpur, 14 miles have been planted (leaving 18 still untouched), and of the 14, 6 miles were during the year replenished with partial success.

From Dera Ghàzi Khan to Dera Ismail Khan (129 miles), 3 miles were planted, of which 2 were replenished.

From Dera Gházi Khan to Sheru (22 miles), 5 miles have been planted, of which 2 were replenished.

From Dera Gházi Khan to Mirhetta (9 miles) 1 mile had been planted and was destroyed by the long remaining flood water; it was replenished during the year.

Rájanpur to Mithankot (11 miles), 6 miles were replenished.

Do. to Jampur (40 miles) 6 miles partly planted; of this 4 miles replenished.

Three nurseries on the Dera Ghàzi Khan to Rájanpur road destroyed by floods were re-established.

A nursery on the Sheru road escaped the floods, and was increased by 1,000 trees.

Another nursery on the Sakhi Sarwar road escaped also, and was similarly increased.

One on the Dera Ismail Khan road was completely destroyed, and was re-stocked.

*Their growth in this district is celebrated.

A fuel plantation started in the "Kotla Sikhani" rakh was destroyed; 20 acres have been re-sown with shisham and mango trees interspersed in clumps. The plantation at present is in two plots.

Expenditure.

24. The expenditure was Rs. 4,423; road-side trees are watered by bhistís; 32 of whom are entertained.

The plantations are maintained by wells, of which there are now 3, and 4 pairs of bullocks.

There were 6 nurseries along the different roads (3 being on the Rájanpur road) for the supply of trees. This is as it should be.

RAWALPINDI DISTRICT.

25. No special establishment is maintained. The tahísl officials and lambardárs superintend the work, and only laborers and bhistis are hired to do the work.

The expenditure is not stated. It is noted that it was Rs. 806 less than last year, but last year no report was sent.

Rain-fall failed

26. The rain-fall being deficient, less work was done, and the success was not great.

Trees planted too far apart.

27. The trees were planted at 30 feet. In my opinion this is very much too far. In a district dependent on rain, I would never plant further than 10 feet. Thinnings carried out the 3rd or 4th year (or even later according to growth) will sell as poles, and the regular revenue thus obtained will amply repay the greater initial labor and cost. If one tree fails, in a row at 30 feet apart, you get 60 feet blank. Shisham was the only species used. But most of the work of the year failed for want of rain.

28. The work is of the usual character. In the Kahuta tahsíl the large number of fourteen different roads received attention, and 125 trees (of what sort should always in such a case be stated) were added to the Government *garden*, of which half failed.

Recommendations.

29. I recommend that in this district the work should be confined to a smaller number of places; that old work should be completed and blanks filled in before new work is taken up. When gardens and groves are made, I would mention the species. The statement of arboriculture, also, is not quite correct, for the *length* of road newly taken up is not stated. Thus, taking an example at random, the road (Fátahjang) from Kalipairi to Chakri is 16 miles long; of this 11 miles have been planted, but not completely so, and 5 miles have not been touched as yet; the return shows that nothing was done on the 11 miles, but that on the 5 miles, 459 trees were planted (on one mile, or two, or what?) In "remarks" I should say briefly—"all shisham trees planted at 30 feet apart, failure due partly to bad soil, partly to failure of rain."

I may here repeat my recommendation to reduce the distance of planting, and to keep up *nurseries* to supply the localities of work easily with strong good trees.

JHELUM DISTRICT.

Summary of work.

30. In the Jhelum tahsíl 20 miles of the Grand Trunk Road have been planted.

In Pind Dádan Khan tahsíl 61 miles have been planted, but not completely; 36 miles remained to be done. The work consisted of planting, both on blanks and on new extension, a large number of trees.

A tank was also planted.

A few trees were plant out in *Chakwál* Tahsíl, and in that of Talagang. A tank was planted up and some 13½ miles of road worked on partly replenishing and partly new work.

No detail of expenditure, &c., is given.

31. A memo. of remarks promised (12th August) has not been received. No data of expenditure are given.

Recommendations.

32. I would invite the Deputy Commissioner's attention to the fact that the table as prepared does not show the real results. The columns when dealing with lines of road are not intended to be filled with number of trees (except as an added remark, which is very proper).

The late date of this report and its incompleteness in this interesting district is much to be regretted.

GUJRAT DISTRICT.

Summary of work.

33. As reported last year, so this, no new work has been done, with the exception that 1½ miles of the new road from the Grand Trunk Road to the Railway Station were planted; about half the distance being "success" and half only partial. This included fencing.

In the Gujrát tahsíl only was any work done, and in 7 miles of road withered trees were replaced and fences restored.

34. The expenditure was Rs. 1,530, the establishment being the same as last year.

Recommendations.

35. I would recommend that in this district more work should be done; the old system of sowing kikar (where the soil is light, in trenches along the road that in former years produced such good results) might be tried again. It answers only where the soil is *light*, the seed being put in with the first rain.

It is always interesting to know what kind of *fencing* is found cheapest and most successful, and whether each tree is fenced or a continuous hedge or fence adopted.

None of the tahsíls except the Sadr appear to have any nursery for the supply of young trees.

SHAHPUR DISTRICT.

Summary of work.

36. This is a dry district, Shahpur having 21·4 inches (which I should suspect to be an extreme measurement), Khusháb tahsíl having 13½ and Bhera 11 inches.

In the Shahpur tahsíl two new roads (7 miles) were taken in hand, and 4 miles stocked with partial success. As only 1,000 trees were taken to the new 4 miles, that is 125 trees for each side per mile (all of which did not succeed), the blanks must be very large.

Expenditure.

37. The expenditure was Rs. 2,377. The establishment has been the same as reported last year, and 80 were spent on cattle, 9 pairs of bullocks and one buffalo being kept.

Nurseries are kept up at convenient places. They are sown in the rains, and the transplants taken out in the following rains.

Shisham, pipal, bor, kachnár, carob bean, and mulberry are used, and kikar is said to be "planted,"—probably sown is meant.

Recommendations.

38. If kikar is ever *transplanted*, this interesting fact might be noted, as it is usually said that kikar is very difficult to transplant, though it *can* be done.

Information regarding the carob tree valuable.

I would also recommend closer planting than would seem to be usually adopted—10 feet apart and even 7 feet where economy of water is necessary and failures are apprehended—is what I think best. Where a special tree like the carob is grown, information as to its success, what soil it likes, how cultivated, whether it fruits, whether indigenous seed is used or foreign seed, &c., should be stated. The Government have taken great interest in the introduction of the carob tree, and in the Forest Department experiments are being made; information therefore about this tree, and the number of trees in the different tahsíls, and where they are to be found, would be very valuable.

Pruning and lopping.

I would also beg the Deputy Commissioner to curtail the pruning and lopping.

GUJRANWALA DISTRICT.

Summary of work.

39. The district varies from "dry" (25 inches at Gujránwála, and 27 Hafizabad) to "medium" (34 inches, Wazírabad).

The work is shown in the appended table. The new work consisted of a part of the road to Ramnagar from Wazírabad, planted with siris and shisham. The road to Dhonkal, much frequented (as a well-known fair is held at Dhonkal) was also newly taken in hand. The first mile succeeded, the second partially so.

In *Hafizabad* tahsíl the soil is poor, dry and salt; nevertheless eight different roads were taken in hand, all for replenishing old work, which is chiefly on the 1st mile away from the tahsíl in each case.

Wells are not used for watering, but trees are supported till able to take care of themselves by hand watering (bhistis).

Expenditure.

40. The establishment (not reported last year) may now be indicated:—

2 Jamadárs @ Rs. 10
7 Watchers (for 6 months only) @ Rs. 5.
1 Gardener @ Rs. 6.
73 Bhistis (for 6 months) @ Rs. 4.

This is for the Gujránwála tahsíl; here also a watcher and four bhistis are kept for the station planting. Each of the other tahsíls has one watcher and from six to nine bhistis.

The whole expenditure was Rs. 3,070, and Rs. 60 was realized from sale of thinnings and loppings.

Extract from Local Report (Nurseries).

41. The following remarks from the report must be quoted :—

"The district was far behind in having nurseries, and could not boast of having any, so in the year 1877-78 a strong attempt was made by the district Committee to supply this deficiency.

"Small nurseries were established at intervals of from two to five miles along the roads in sites having advantages of well water and of careful cultivation and supervision.

"The Committee supplied the seeds and paid Government demand, &c., on the plots taken up for nurseries. The nurseries were then left in the hand of cultivators without any further immediate payment, but with a promise of reward proportioned to the results of his care and tending; and honors were also promised to such zaildárs and lambardárs who should make themselves conspicuous by evincing active zeal and interest in the subject.

Method of providing for maintenance.

"The result of the experiment was a most satisfactory one, and one that could not have been hoped for but for the above consideration.

"Most of the nurseries flourished splendidly, and in February and March the Committee was able to plant from the supplies of these nurseries, at a very little cost, 40 or 50 miles of roads.

"The experiment is well worth repeating, and it may be hoped that by extending similar operations we will be able to provide all the main lines of communciation with shady and splendid trees."

Method of working.

42. All work is done by transplanting, from nurseries, trees of one year old (directly from the seed bed, no second planting in the nursery being given). The trees are fenced with thorns and established by bhistis watering; shisham, sifis, and kikar are used.

I presume (see Shahpur district) that kikar is not raised in nurseries for transplanting; if it is, this fact, as of interest, should be noted.

Transplanting is done both in winter and in the rains.

Lopping.

43. It is satisfactory to note that pruning, where necessary, is done by the saw, and not by the rough "dránti" or a blunt hatchet.

Recommendations.

44. This report is very satisfactory. I should be inclined to restrict the work to fewer roads, even than at present, in Háfizabad, and try the system of raising *farásh in trenches*; both cuttings and seed can be used.

LAHORE DISTRICT.

Summary of work.

45. Major Harcourt has explained the circumstances which hindered the development of his plans for arboriculture during the year; but there is no doubt that this subject is well cared for. As an excellent beginning, a definite plan was arranged for each tahsíl, taking up the roads, sites of planting, &c., in detail according to the order of their importance, and instructing that each mile should be finished before another mile was touched. This method of working, if adhered to, will prove the key to economy and to success.

Some progress, however, was made. It is reported that the towns of Kasúr, Chúnian and Sharakpur, now possess large and handsome gardens, which serve also as nurseries from which young trees are supplied for avenue planting.

The bazár at Anárkali is being planted, so that in time it will be completely shaded.

In the capital, various station roads were replenished. The other work is shown in the table appended.

Recommendations.

46. I have only to suggest regarding this report, that at *Lahore* itself, wherever a tree is put in, a fence should be given, or the destruction of the tree by cattle, &c., is certain. I have noticed holes in parts of Lahore, which I am sure have been, since my acquaintance with the station, filled again and again, perhaps a dozen times, each tree being browsed down.

Expenditure and income should be stated.

FEROZEPORE DISTRICT.

47. I beg to point out that it is not stated what sort of rain-fall the district has.

Summary of work.

The work here may be summarized here, as I cannot include it sufficiently in the general table.

Thirteen different roads leading from the city or cantonment were treated; a few miles of each were replenished, some miles being only partially successful; the tabular statement is not intelligible, however, on this head.

On most of the roads *new* work (*i. e.*, on the unplanted portions) was attempted, but cannot be made out, *e. g.*, on the road from the city to Makhú (11½ miles) it is said that on the first to tenth mile 91 trees were planted; that is about ten trees to a mile, and that this was only partially successful.

Three roads in Mogah, three in Zirah and six in Muktsar were treated. The work in Mogah and Zirah may be new work.

In Zira the work apparently was on the road from Kot Isa Khan to Data (six miles treated); 26,450 trees were planted, of which 24,200 failed. This would give less than a foot apart, and perhaps this refers to *farásh cuttings*, which might have been put in in great quantities, and the work must have been very badly done.

Groves also formed a feature in the work. Seven groves in the Ferozepore tahsíl, two in Moga, and three in Zira, were new works, the area not being stated; ten existing groves in Muktsar were both extended and replenished.

Expenditure.

48. The expenditure was Rs. 4,911, and no income of any kind is mentioned.

Recommendations.

49. It is stated in this district that farásh cuttings put in in February are the most used. I should have thought that where these depended on rain or bhistis, cuttings put in at the beginning of what rainy season there is, would have succeeded. I would also recommend the system of cutting long narrow trenches about two feet or 18 inches deep, and two feet wide, and either sowing farásh seed or planting cuttings at the bottom; the large number of failures would seem to show that the cuttings are not properly made.

It is presumed that where canal water is available, other trees are grown.

Where groves are made, a nursery with a well is established, and the grove is then formed by transplants. Sometimes inundation canal is available; sometimes hand watering is resorted to.

I would recommend that this district work should be restricted to fewer places. It seems far too many places are attempted at once.

MONTGOMERY DISTRICT.

Summary of work.

50. The statement is not prepared quite correctly. One road in Dipálpur tahsíl and one in Pákpattan were treated; only one mile of the latter and six miles of the former had been planted (as should have been stated in column 5), and the attempt to fill blanks resulted in failure.

In the station of Montgomery 6,993 trees were planted in gardens at dák bungalow, church, &c., where trees were already existing to a certain extent, and 1,661 trees were planted in new places.

Some trees were planted at the Chichawatni dák bungalow, and 1,916 trees were added to the Dipálpur tahsíl garden. A grove was made at Gugaira, and 5,318 trees planted out in the tahsíl at different places.

Paying for the maintenance of trees.

51. The plan noted in last report of paying zamíndárs Rs. 2 per 100 trees to water and keep them alive cannot be judged of, for the year past, as only Rs. 50 were paid under this head; but the Pákpattan Tahsíldár had not sent in his accounts, and this is the chief tahsíl in which the system is worked.

Expenditure.

52. The establishment (bhistis and water-contractors) cost Rs. 334, and was less than last year apparently, thus—

1 Water-contractor at Chichawatni	...	@ Rs.	10
1 Do. on the Pákpattan Road	...	@ „	4
1 Bhistí at Okára ...	...	@ „	5
1 Do. at Dipálpur ...	...	@ „	5
Gardener and coolie at Gugaira (employed from November only)	...	@ „	9
Total per mensem		Rs.	33

The expenditure was—			
Establishment	...	Rs.	334
Contingencies—Feed of bullocks, &c.	...	„	500
Nurseries	...	„	225
Carriage of plants	...	„	291
Miscellaneous	...	„	36
		Total Rs.	1,386

The cost of the bullocks is chiefly for the station of Montgomery. The cost of watering trees by zamíndárs is not included in the above.

Recommendations.

53. It is not known what species succeed best in this district, for it is said that this was reported last year, but I do not find any allusion to the subject.

It is also added that lopping and thinning are "attended" to. I hope, in this dry district, that this means the former is not allowed at all.

Thorns are used as fences only.

MOOLTAN DISTRICT.

Summary of work.

54. On roads no new work was done; but several avenues were replenished, as shown in the table.

Groves.

Seedlings of *kikar*, shisham, and siris, were put out in the existing groves of the Lodhrán and Serai Sidhu tahsíl compounds, about 2,000 being successful in each, as the former is 1½ acre, and the latter ½ an acre. The one must be well, the other thickly stocked, as 4,840 trees to an acre would be planted at a distance of 3 × 3, and 1,210 trees to an acre would be at 6 × 6.

One other grove at Jalálpur thána (of ½ an acre) was also stocked successfully with 1,000 seedlings.

Nurseries.

Nurseries were re-stocked at Lodhrán, Serai Sidhu, and Jalálpur; it is hoped that these are not the groves mentioned above, because groves are permanently planted, whereas nurseries are quite a different thing, and are intended to supply young trees which are constantly removed.

Expenditure.

55. The expenditure was as follows:—

Establishment—

2 Jamadars ... ... } 16 Malís (including feed of bullocks) ... }		Rs.	1,364	
Labor in planting and watering	...	„	1,000	
	Total	Rs.	2,364	

Recommendations.

56. It is satisfactory to notice that "bor" and "pipal" cuttings are largely used. It will be found, however, that *natural* seedlings of these trees taken up from near old trees with great care will make splendid growth, especially pipal cuttings, which are not nearly so easy to raise as bor.

I beg to call attention to the remarks about nurseries as distinct from groves.

Are *kikar* really *transplanted* from nurseries?

I would also recommend the cultivation of mango trees wherever possible.

It is stated that *lopping* commences in November, and *continues* (let us hope not) till February.

Circular mud walls are found to be the best fence for trees (used for each tree separately).

JHANG DISTRICT.

Method of working.

57. The work in this dry district (9 to 12 inches) can only be maintained by wells, and I do not understand that any attempt is made (as in Ferozepore, Montgomery, and other dry places) to use bhistis for hand-watering.

There are 15 "arboricultural" wells belonging to Government, and 56 belonging to private persons but used to water roadside plantations, remuneration being given for this use; 16 pairs of bullocks are kept up.

Expenditure.

58. An establishment of 40 men at different rates of pay cost Rs. 2,430 a year; so that the expenditure is thus summarized:—

Establishment	...	...	...	Rs. 2,430
Feed of cattle	...	...	...	„ 270
Labor, &c.	...	...	...	„ 300
			Total	Rs. 3,000

Income.

59. An income of Rs. 27 was obtained from lopping.

Summary of work.

60. The work consisted in replenishing the nursery at the Sadr was 7,379 trees, and also filling up 300 trees in the nursery attached to the tahsíl garden at Shorkot. These nurseries supply apparently all the trees that are put out in roads throughout the district.

In the Jhang tahsíl, the road from the Sadr to Shahpur district boundary, to Kharora, and to the Chiniot Road to Khaki Shah, to Trimmu to Lahore, were all treated, one or two miles on each being replenished with success.

In Chiniot, the road from Jhang had one mile replenished. There is a garden of five acres at the tahsíl to which nothing was added during the year.

In Shorkot (which is better off for moisture, having 19·4 inches) two miles on the road from Jhang were replenished.

There are in this district certain 'chaks' or plantations. That at Sajowal (24 acres) is said to contain 61,493 trees (of what species?). At Chakalyána there is a plot of 64 acres.

The Chak Chiniot was carried away entirely by the Chenab river.

MUZAFFARGARH DISTRICT.

61. Also a dry district (rain-fall 11 inches), although near the river shisham trees attain a fine development.

Summary of work.

In the Muzaffargarh tahsíl, a mile of *double* avenue from Ganeshwah bridge to the Telehri garden was completed. Other work is summarized in the table.

To the Telehri garden (26 acres) 110 fruit trees (mangoes, oranges, figs,) were added with success, only five dying from frost.

Expenditure.

62. The expenditure is given as Rs. 2,929,

The permanent staff is separately shown for *road* work, as —

1	Jamadár	@	Rs. 7-0-0 per month
4	Gardeners	@	„ 5-0-0 „
20	Bhistis	@	„ 57-8-0 „
20	Bullocks were maintained at a cost of Rs. 541.		

While for groves, 7 Mális costing Rs. 30 per mensem, 6 Bhistis at Rs. 22, are separately maintained. Two bullocks worked a well, and their keep cost Rs. 68 a year; a pump was also brought from Lahore, costing Rs. 47.

Establishment for roads	Rs.	1,014
Do. for groves	„	624
Keep of cattle	„	609
4 pumps	„	47
Total	Rs.	2,294

Method of working.

63. Young trees are supplied from the Telehri garden nursery and the nurseries on the Khangarh Road.

Transplanting is done only during the rainy season (July and August); transplants 6′ to 7′ high are preferred.

No lopping done.

64. It is satisfactory to observe (for the first time as yet) that no trees were lopped during the year. Fencing by hedges and "tháonlahs" is practised always.

SIALKOT DISTRICT.

65. Though a fairly-watered district in average years, the want of rain in 1877 and 1878 determined the authorities against attempting new work, and they confined attention to maintaining existing trees and replenishing. This will be seen summarised in the table.

Summary of work.

Nurseries.

66. A new nursery was started in Pasrúr (Dodhá on the Amritsar road) and seed sown; 100 trees (the sort might have been mentioned) were planted in the tahsíl garden; and 40 trees planted at the ground where the Gulu Shah Fair is held.

The Talwandi nursery was extended by sowings. There are now four nurseries in the district for supplying avenue and other trees.

67. It is worthy of remark that the four European olives in the Siálkot garden bore fruit this year. The garden is a large one (27 acres), stocked with choice trees, fruit and other. Part is used for a nursery to supply trees, and it has been most useful as a centre of distribution, with a view to encouraging zamindárs to cultivate valuable trees for themselves.

Fruiting of the European olive.

Expenditure.

68. The total expenditure is thus summarized :—

1	Supervisor @ Rs. 20 ...	Rs.	240
5	Jamadárs (4 months) ...	„	208
12	Chaprassís (4 months) ...	„	279
16	Mális and 51 bhistis ...	„	1,838
		Rs.	2,565
	Contingencies ...	„	135
	Total	Rs.	2,700

69. The Jamadárs and Chaprasís were found to be useless (as indeed might be expected), and were discharged. The plan of having one or more head-men, if they know anything about sowing, planting, lopping, &c., is a good one, and perhaps a few permanent and *fairly paid* Jamadárs to keep people up to their work would be the best form of fixed establishment, in addition to gardeners.

Local remarks as to establishments.

70. An income of Rs. 972 from lopping is reported, and I would beg for consideration (if this is really from lopping, not from thinning out of closely-planted trees) of the great mischief that must be done by it.

Income.

71. An experiment was made of sowing shisham and siris broadcast, on the berms of district roads, where space permitted. I would suggest as an improvement on this, sowing these species and kikar wherever the soil is light (*i. e.*, has a fair proportion of sand and does not 'cake') *in trenches*, 12 inches deep, the soil from the trench being pulverized, and part of it put back in the trench, the rest being left on one side. Sow in the trench just before the rains set in.

Experiment.

72. Colonel Birch is going to try the Eucalyptus in Baijwat; no doubt it will succeed, but there are 160 Eucalypti, so that it is *absolutely* necessary to note the second name. I recommend *Resinifera saligna, Rostrata*, and possibly *Tereticornis*, which latter seeds at Abbottabad.

Eucalyptus in Baijwat.

73. The "Bund" on the Aik river has been thickly planted with múnj, and will give an income. I should be afraid of this spreading to the fields, and becoming a nuisance. This can indeed be regulated by cutting the flower heads before the flatty seed is ripe.

Planting múnj, caution needed.

AMRITSAR DISTRICT.

74. This district is only in the "dry" class, though it has a rain-fall, which (if a given season maintains the average) should in fair soil (*i. e.*, where it is not heavy clay or 'kalr') raise the rougher sorts of trees without artificial irrigation. Amritsar has 25½ inches, Tarn Táran 24·2, and Ajnála 22·6 inches.

75. The work of road-side avenues calls for no remark: it is summarized in the usual table. It may be noticed, however, that the embankment of the Ajnála-Ramdas road has been thickly set with farásh cuttings, a very useful work.

A grove at the Sadr station was re-stocked, and a new grove at Changaon, where, however, the seedlings were severely damaged by hail.

76. The rain-fall during the year was below the average, which accounted for the partial success attained; while to ensure even that an additional expense had to be incurred for hand-watering by bhistis.

Failure of rain.

77. There was only one central nursery for distribution, but a new one has wisely been started at Changaon (Ajnála tahsíl). Others are promised to obviate the expensive carriage of trees.

Nurseries.

Expenditure.

78. The expenditure was Rs. 6,665, thus—

Establishment (1 Darogha on Rs. 40) 1 Jamadár, 4 peons, 6 gardeners and about 47 bhistis and 28 laborers ...	Rs. 5,772
Expenses;—Contingencies, fencings, extra waterings, &c.	„ 893
	Rs. 6,665

Income.

79. The income by sale of trees and loppings was Rs. 746.

GURDASPUR DISTRICT.

80. This district is classed as "medium," varying from 50 inches at Pathankot to 39 at Shakargarh, and 30 at Gurdáspur; Batala tahsíl is drier, having only 25 inches.

Nothing in the statement of work calls for particular remark. It may, however, be noted that at the Sadr, 2,600 trees were added to the Government garden, but half of them failed.

294 Tún trees were successfully added to the three-acre tún grove near the Kacheri.

30 trees were also added to a three-acre mango grove.

Expenditure.

81. The expenditure was Rs. 3,299 thus, or excluding Rs. 240 subcription to Agri-Horticultural Society, Rs. 3,059.

Each garden has wells and bullocks.

Gurdáspur, gardeners and coolies (16)	Rs. 1,008
Batála, 1 gardener and coolies	„ 108
Shakargarh, gardener and coolies	„ 103
Pathánkot, ditto ditto	„ 120
Bhistis (for whole district)	„ 1,238
Feed of cattle and contingencies	„ 377
	Rs. 3,059

82. This district is now able to report that it has 212 miles of road fairly planted up, only a few blanks to be filled. There are also 23½ acres of groves.

Results of work in this district up to date.

83. I take occasion to note that I observed the new part of the road to Pathánkot, which has been planted, very properly quite close, I suppose some four or five years ago. This now wants thinning very badly. Many trees have two stems or more. All should be removed but one, the best; regular spacing should not be aimed at, but the removal of badly-shaped trees and those leaning over, of which there are many.

Avenue thinning.

KANGRA DISTRICT.

84. This district is almost within the moist Himalayan belt.

The Pálampur Tahsíl is said to have an average fall of 112 inches (which I respectfully, but very strongly doubt); Kángra Tahsíl has 75; Dehra 78; Núrpur 85; Hamirpur 51; and Kulu 58 inches

Summary of work.

85. The work is summarized in the "table." It would appear that nothing at all was done in Kulu in the way of roadside planting.

In Kángra (at Dharmsala) 7,000 deodar seedlings were put out.

In the Tahsíl compound at Pálampur also, *these* cannot be expected to be of any value (except for ornament) at so low an elevation.

In Dehra, Núrpur and Hamirpur, groves of mulberry, túm, mango and jáman were begun, and it is hoped will be extended.

In Kulu 180 "English trees" were planted. It is a pity these were not specified, as the term used is absolutely without meaning.

Expenditure.

86. The deficiency of funds is spoken of, and indeed only Rs. 801 were spent; a very small establishment, costing Rs. 234 in the year, is kept up.

Recommendations —Importance of "túm" cultivation as highly remunerative.

87. In this district I would impress on the authorities the immense importance of restoring *túm*, as a source of great income to the district, 30 years or so hence. Túm has been almost exterminated, yet in districts like Kángra, Gurdáspur and Hoshiárpur is its home. Wherever a grove, even a very small one, of túm trees can be raised, it should be done.

No work now done in Kulu.

In Kulu, I think it is a pity that year after year nothing is done in the way of arboriculture on roads.

Work suggested.

I would point out, for example, the case of the hot and dreary road between Bajoura and Larji, and suggest that the dry willow, the Pipal, and in better places the Ríta, should be tried; or little groups of trees, two or three together, might be put in at intervals. Pipal does perfectly well; there are a very few already at this elevation.

As this is a difficult work, a short distance only should be undertaken.

Work in Kángra too extended.

I think that generally the work in Kángra has been extended over too great a length. It was unwise to attempt such a length of road when the rain-fall was not certain; in one place no less than 29 miles failed altogether.

I think a somewhat larger sum might most advantageously be spent in a district with such capabilities; while Amritsar and other districts spent five and six thousand rupees, this district spent less than Rs. 1,000.

I cannot help urging the growth of túm once more, as certain to pay most handsomely. *Wherever* a grove can be raised, at every thána, school, dispensary, &c., &c., it should be.

HOSHIARPUR DISTRICT.

88. It is to be regretted that no statement accompanies this report, although last year a mos complete return was furnished, as should be the case in a district which has great natural advantages, plenty of funds, and should be the pattern for all other districts in arboriculture.

Rs. 5,885 was the amount of the expenditure.

It is stated generally that 27,761 trees were planted, partly in filling up gaps (replenishing), partly on new work—what or where is not stated.

89. "Several species" of *Eucalyptus* gave encouraging result; but I would again invite attention to para. 13 on the subject of *naming* the *Euclypti* which succeed. Some mesquit-beans received, and after a few failures in the winter, the rest succeeded, and are now at a height of 2 to 4 feet.

90. The experiment of growing bamboo by the roadside is said not to have been yet fairly tried. I would suggest that while the hard bamboo of Karnpur, &c. *(Dendro calamus strictus)*, may not be so useful, the larger bamboo, seen in such graceful clumps in Kángra, might succeed; but of course not except

in good and moist soil. Division of roots is really the best way to grow bamboos of all sorts ; cultivation by seed is a very slow process.

Mistake in last year's report, para. 32.

91. I take occasion to correct a mistake at para. 32 of last report. The tree is not *diospyros montana* but the *gmelina arborea*, (gumhar), a tree which will succeed wherever protection from frost is to be had. In my garden at Lahore two trees fruit abundantly in May 1879.

JULLUNDUR DISTRICT.

92. This is a " medium " district, Nawashahr tahsil has the least rainfall (27 inches) and Nakodar the most, 44 inches. Nearly everywhere, therefore, in *average* years, trees can be raised without irrigation.

This also is a district where *tún* should be cultivated, as one of the most paying crops, likely to add largely in a certain time to the district income.

93. Among the works noted in the table, it should be mentioned that in the Nakodar tahsil on the Dekni road, about 2 acres have been selected, and a beginning made by putting out 100 Chinese mulberry (*M. at ropurpurea*).

At Phillour there were 2 village plantations of shisham, at Gulábwala and Saigábád, also an acre and 5 poles shisham nursery. At Hasanpur a number of date palms were planted.

There are 32 groves on the Sutlej, which are periodically thinned and re-sown with shisham.

At the Jullundur garden a large nursery is maintained, and valuable trees, both fruit and timber, are planted. During the year mesquet-bean, Malta oranges, good kinds of vine, fine peaches, and plantains have been introduced.

It is also said that 400 China mulberry cuttings, obtained from Amritsar, were established and distributed to places on road-sides *in each tahsil* ; this is in excess of what is stated in the tabular form.

Establishment.

94. For the river side groves a permanent establishment of a Darogah @ Rs. 15, and 6 peons are kept up ; and as the income during the year was Rs. 353, the establishment was more than paid for.

For the district rakh or Bir Sarangwál (recently declared a reserved forest under the Act), an establishment of Rs. 12 a month is kept. A gardener @ Rs. 10, and 4 coolies take charge of the Jullundur garden.

For roads, as in previous years, a permanent gang of road-coolies do both repairs and planting. This system seems to be a good one, as the men must get in time to be experts.

The expenditure was Rs. 2,068, of which 924 covered the cost of establishment described.

Recommendations.

95. I would suggest to the Deputy Commissioner the desirability of gradually converting the Bir Sarangwál into a fuel plantation: I would make trenches at 4 feet apart, loosen the earth and replace it, and sow kikar at the beginning of the rains. A small area planted each year would soon convert the whole into a valuable plantation, without all at once diminishing the grazing income.

LUDHIANA DISTRICT.

96. This is a " medium-to-dry " district, though the statement does not contain, as it should, the rainfall of the tahsils.

The work calls for no special remark ; it was very small in extent and quantity. The expenditure was Rs. 5,827, which appears large for such a small amount of work ; it is said, however, to have been chiefly spent on maintenance of previous work, and if this was recent, of course it requires as much care in watering, &c., as new work.

Great attention is paid to fencing and protecting the trees.

Recommendation.

97. It would be desirable in future to state what items of expenditure are for maintenance charges, so much for bhistis, so much for fences, &c. Both in 1877 and 1878, over 5,000 rupees were spent in " maintenance," and it should be known how the money is spent.

The District Overseer supervises the labor employed ; there is no special arboricultural establishment.

UMBALLA DISTRICT.

98. The return is blank, and nothing is said of expenditure, establishment, or anything else. This is hardly satisfactory in a district with considerable capabilities for planting. Tún, the China mulberry, the tallow tree, and even the sál, might be grown with advantage.

SIMLA DISTRICT

99. Has no arboriculture.

KARNAL DISTRICT.

100. This is a "dry" district, with a rainfall, however, of 24·3 inches in Karnal and 224 in Panipat.

The Statement sent is very complete, indeed more so than is needed; it becomes rather difficult to summarize it in the return. Only totals of tahsíls are required as regards length of road, number of acres, or number of unmeasured plots.

In this district it may be noted the Jomoa (*Elæodendrun Roaburghii*), a very handsome tree, is planted on the roads.

Three nurseries, one at each tahsíl, were filled up and extended.

101. The expenditure was Rs. 4,024. Of this Rs. 2,267 was for maintenance (39 bhistis, 6 pakhálís, costing Rs. 1,732, the rest for gardeners and repairs of mud-wall fences).

Rs. 1,757 was the cost of new work—watering, planting, and mud fences. Rs. 704 was spent on the nurseries, for the wages of gardeners, and the feed of the well cattle and for contingencies.

A detailed estimate was prepared at the beginning of the year, both for maintenance and for the year's new planting and replenishing.

102. The Kaithal tahsíl planting is noticed as the best. The Deputy Commissioner says the trees were planted too close, but I would suggest to him not too readily to discourage close planting: trees here and there may fail. It is much better to plant close and thin out, than to begin too far apart at first.

Recommendation.

The work has evidently in this district received very methodical attention. The Deputy Commissioner himself remarks, however, that the work was too scattered, and proposes next year to confine the area.

I would also suggest for this and every other district wherever the soil is tolerable, to have a central garden, and there to raise good fruit trees, oranges, and so forth, also useful products like the China mulberry, &c., &c., so as to distribute them to villagers and increase the supply of good fruits in the district.

DELHI DISTRICT.

103. The rainfall of the tahsíls is not stated.

It is unfortunate that in the Delhi tahsíl nearly 22 miles, and in the Ballabgarh tahsíl nearly 34 miles, of "replenishment" undertaken, all failed from drought.

In Delhi tahsíl one mile of new road (serai Rohilla Khan to Najafgarh) was successfully planted.

Of groves and plantations it is noted that 50 trees were planted at the school-house of Nanglo Jitan, and 4,700 trees, of which 3,000 were "nim," planted successfully at Mubárik bágh, near the old cantonment.

One thousand four hundred trees were also planted within the compound of the Ballabgarh fort.

104. The expenditure was Rs. 1,843 (or 1,723, excluding 120 subscription to the Agri-Horticultural Society), of which Rs. 904 was for establishment, and Rs. 819 for maintenance, fencing, &c.

105. Besides this work, the district authorities managed the Bela plantation under the walls; the expenditure was Rs. 1,289, and the income Rs 510 from thinnings. This plantation, with its costs and income, is now handed over to the municipality. Rain sowings of 50 acres were a failure from flood, and the later sowings (22 acres) from frost.

Bela plantation.

106. The municipality also spent Rs. 3,960 on their trees within municipal limits, including an important work, which should be noticed, of planting 3,000 trees, chiefly nim and kikar, on "the ridge;" these are said to be thriving.

Plants the ridge.

107. It is a pity that when the failure of the rains was noticed, orders were not given to stop or not to attempt work. The very extensive failures must have been costly.

Recommendations.

It is noted in the report—and this is a wise conclusion—that it does not do to depend so much on *sowings in situ* along the roads, and consequently nurseries have been extended, so as to furnish more *transplants*, which generally, and especially if the area is wisely restricted, can be saved by hand-watering in case of a bad year.

GURGAON DISTRICT.

108. This is a dry district, and the rainfall is variable also; it averages from 16 to 18 inches.

The work on roads, consisting in "replenishment," or filling gaps in previous work, was as follows on roadsides and was not very successful:

The nurseries, the station garden, and the Jhersa bund were planted or sown with a fair amount of success.

At Taoru the compound of the Police rest-house was planted with 2,000 trees, and the "Committe house" with 680 trees.

In Palwal tahsíl 1,645 trees were successfully planted on a plot of ground opposite the tahsíl, and 410 trees were put out on the different encamping grounds.

109. It is stated that on roadsides 39,889 trees were alive at the close of the year, including previous work, and 21,058 trees elsewhere than in avenues.

Expenditure and working.

110. Expenditure amounted to Rs. 2,559; this excludes the station garden nursery, which is "charged to another head."

This garden and the station roads are watered by a well with the "lao-charsa," or rope-and-bucket method of raising the water. Other trees are watered by hand, one bhisti being allowed to each mile of road.

On the Palwal Sohna road, the water is supplied by the canal, but it has to be carried by laborers to the trees.

Out of the expenditure mentioned, included Rs. 2,101 for establishment, of which Rs. 803 represent the costs of bhistis for various periods. A "darogah" on only Rs. 6 must be rather an inferior class of man, and can hardly be of much use.

Mud fences, it is noticed, cost 5 annas each.

Lopping

111. It is gratifying to notice that lopping by the mális, &c., is not allowed. Mr. Roberts thinned the Sohna road avenue under his own supervision.

Kikar sowing.

112. The Deputy Commissioner notices kikar sowing. In order to succeed, it must be light soil which powders easily. A trench is made and the soil pulverized, and partly put back, so as to let the trench be partly hollow to collect rain. If no rain falls the kikar seed will not germinate; but the method is so cheap (where there is any chance at all of its succeeding) that it does not much matter if a failure or two occur: the trench remains and the earth only wants loosening again and re-sowing.

Trees killed down by frost.

113. The way to treat trees which have been killed by frost and then send up new shoots, is at once to cut back all but two or three shoots the first year, and all but one, the best and strongest, the year following. Unless the frost again kills the tree down, the surviving shoot will often make a tree quite as good as ever. If, however, the frost is such that year after year the trees die, it shows that nim and jáman, which are sensitive, cannot be cultivated. Siris will succeed in the end: it is very hardy.

Farásh cuttings.

114. Farásh cuttings 4 feet long, and somewhat thicker than the thumb, are the best; they require water to start them, and not to be driven into the ground, but the ends being clean cut on a slant, a hole is to be *made first* with a stake or iron jumper, and then the cutting put in, about half above and half below ground, and the earth pressed down. Farásh *sowing* in trenches may be tried also.

HISSAR DISTRICT.

115. This is one of the very dry districts. All the "replenishment" on 23 miles in the sadr tahsíl failed, one mile on the road to Barwála being partially successful with 250 trees, making a now existing total of 646 trees on the mile.

In the Hansi tahsíl, 8 miles of replenishment were partly successful.

In Bhiwaní, half a mile was a success.

In Fatehábád, a little over a mile succeeded on two different lines.

In Barwalla, 2¼ miles "replenishment" failed.

116. While the road work showed so little success, the list of groves and plantations shows better results.

In Hissar itself 14 different places—the Park, Station Garden, Post Office, Dispensary, Police line, &c., &c., were successfully planted.

In the Hansi tahsíl a nursery was established at the encamping ground, at the school, distillery, dák bungalow, and a town road was planted, the latter being a new work.

In the Bhiwaní tahsíl, 10 localities of the same description were supplied with additional trees successfully; and in the Fatehábád tahsíl, 11 similar localities were added to with "partial success" chiefly.

In Barwalla, 7 localities were also treated with partial success, chiefly with kikar sowings.

Expenditure.

117. The expenditure was Rs. 3,499, or Rs. 3,247 excluding the municipal fund expenditure.

The establishment costs Rs. 181 a month, or Rs. 2,178 for the year. This includes 10 pakhális @ Rs. 7, 3 ditto @ Rs. 6, and 2 bhistis; this is maintained, as watering must be the chief thing in such a district.

This district *alone* shows as part of its expenditure "Irrigation dues," 3 pairs of bullocks were purchased.

Recommendations. 118. I observe that in some places it is noticed that trees failed owing to stray cattle. In such a district I would lay it down as a rule that no tree is to be put out without a fence, palisade, or enclosure of some sort. The trees have difficulties enough to contend with, without such a purely avoidable one as cattle-browsing. I would be inclined to keep up fewer gardeners, &c., on low pay, having a few good men, taking on daily labour when required, and requiring each tahsíl to confine its road operations to one or two places to be slowly and carefully gone over, fencing each tree and covering the soil round the trees with a thick matting of loose straw, dead leaves, &c. (3 inches), to retain moisture.

Method of economizing moisture.

ROHTAK DISTRICT.

119. This is a dry district, the rainfall being 21 inches at Rohtak, 22 at Sámplá, 23 at Gohánâ, and 20 at Jhajjar.

The work in the table calls for no remark. Failures from "blight" are recorded, but I do not know what is meant.

No groves or plantations were made or repaired.

120. The expenditure was Rs. 4,049. Of this Rs. 3,801 was spent on establishment, consisting of 1 Superintendent @ Rs. 15, 37 malís costing Rs. 1,940, and 35 bhistis, who use their own pakháls and bullocks, and bring water from the nearest tanks and wells. The district committee have not sunk any wells of their own, as the depth of water line is great and the expense would be enormous.

The operations for the year were estimated before hand.

Kankar in the soil. 121. It is said that kankar is a great cause of failure at from 4 to 6 feet below the surface, and thick bed of kankar, from 4 to 5 feet thick, was discovered; below that, the soil was soft. It is surprising that 6 feet of earth above the kankar should not support most ordinary kinds of trees. If it is not so, there is no chance but to dig through the kankar, which must be rather costly. Wherever the kankar is near the soil, it should certainly be adopted. Wherever it has been tried the result has been success.

Nurseries. 122. There is a nursery at each tahsíl, and a few on the roadside.

It is proposed that in canal villages small plots of nursery shall be formed at the head-quarters of the ala-lamberdars; this is to be discussed by the district committee, as it may involve paying for land.

SIRSA DISTRICT.

122*a*. This is a difficult district. Although the rainfall does not show the aridity, *e. g.* of the South Punjab districts, Sirsa has 23·4 inches rainfall, Dabwali 17·4, and Fazilka 17·8 inches. The work was ordinary and calls for no remark. Its contents may be seen in the table.

123. The expenditure was only Rs. 679.

The trees when put out are usually fenced with the thorny branches of the (beri) *ziziyphus nummularia*, held down by clods of earth. Rain *sowings* are usual. Nothing is said about transplanting.

CANALS.

124. It should be explained, for the sake of those not familiar with the subject, that the area available for planting on a canal consists of part only of the strip of land taken up.

Ordinarily speaking, the material excavated from the canal is thrown up part on either side, leaving, however, next the channel itself a roadway used as an inspection road. The "spoil" is levelled off. Beyond the spoil, again, comes the boundary ditch, and beyond that, the boundary road, which country carts go along, which they are not allowed to do on the patrol or inspection road.

Line plenty. The *avenue* or *line* of trees on a canal will be on the outer side of the patrol road, or side next the spoil; on the inner side, next the channel, trees are not allowed, as their roots would injure the banks, &c.

Plantation by area. The levelled top of the spoil bank constitutes the *area* available for broadcast sowing or grove planting, and is usually stated in acres, while the line along the patrol road is, of course, given in miles. As on the slopes of the bank no trees are planted or sown, the avenue or tree line is distinct from the plantation.

Natural stocking. 125. In some canals it is observed that no avenue is planted, only the spoil bank is covered with trees. In many places this covering is by natural spread of seedlings. In some also (as Dera Ghazi Khan) it is partly one, partly the other.

I would request Canal Officers not to exclude the length of line or area of spoil bank naturally stocked. However it has happened, it is just as much stocked as if it had been planted, and it is easy to add a note or "remark" to explain.

Length includes *both* sides.

126. It is always understood that the *length* given refers to both sides thus—300 miles means a canal of 150 miles course on both sides.

Wherever a canal and its branches has been completed, the total length will remain constant; but in other cases it will vary as new lengths are constructed or new branches added.

The 1st Division Bari Doáb Report has not been received.

Bari Doab, 2nd Division.

I. Avenue.

127. Total length ...	Lahore branch ...		124	miles.
	Lower main branch ...		186	„
	Kirn escape ...		23	„
			333	„
Avenue complete			280	miles
Avenue incomplete			53	„

Work of the year.—Planting 4,000 trees on the incomplete portion, how many miles is not stated. 75 per cent. of the trees succeeded.

II. Spoil Banks.

128. Area sown already, 2,077 acres; added during year 100 acres; still remaining to be done 1,423 acres.

The 100 acres were in two different places; 31 acres were *sown* with shisham,—this succeeded, the rest failed.

A portion of the unplanted spoil is either too high to get moisture, or of such bad soil that only tamarisk can be cultivated.

III. Chauki Compounds.

129. The following fruit trees were added :—

50	Orange
104	Peach
8	Plum
20	Black plum (allú bokhára)
35	Vines.

IV. Management.

130. Thinning has been carefully carried out; 45,000 maunds of fuel (about 180,000 cubic feet stacked) was readily sold at Rs. 20 per 100 maunds (about Rs. 5 per 100 cubic feet).

Sisu is the principal tree in the division.

131. An interesting fact should be noted, that in very bad places trees are gradually being established by digging large holes, which are filled in with *berm silt* from the canal.

131. The financial aspect is thus stated :—

Receipts—

Sale of wood	Rs.	9,060	
Grass and fruit	„	2,751	
			11,811

Expenditure—

Establishment	Rs.	3,205	
Working	„	3,735	
Sowing spoil banks	„	1,434	
Maintenance of compound		540	
			8,914
		Surplus...	Rs. 2,897

Upper Sutlej Inundatin Canals.

132. There appears to be 301 miles in this division, as follows:—

Katora Main Canal	66	miles.
Attari Rajbaha	23	„
Pakoki do	10	„
Chúnian do	17	„
Khanwah Main Canal	81	„
North Rajbaha (18) and south Rajbaha (12) ...	30	„
Bahawaldas Rajbaha	5	„
Upper Sohag Main Canal	57	„
Bunga Saliwal Rajbaha	5	„
Baparwat do	7	„
Total...	301	miles.

No distinction is drawn in this division between a line of *avenue* and the spoil bank planting. The whole gets covered with self-sown seedlings, chiefly kikar. This is helped here and there by sowing.

It can easily be stated what length of this canal line is stocked, and so requires no further planting.

The area of spoil banks is said to be 1,500 acres, which seems to be very small for such a length of canal.

133. Financially the results stand (no establishment being kept)—

Income—		
Sale of wood	Rs. 703	
„ grass	„ 1,308	
		2,011
Expenditure—		
Maintenance, &c.		237
Surplus...	Rs.	1,774

134. The districts are said to be rainless, and that arboriculture would not pay; nevertheless, if self-sown seedlings answer the purpose, it seems that some statistics might be given.

Lower Sutlej and Chenab Inundation Canals.

135. The length here is 10 miles on the canal and 32 miles on the Chenáb bund; total 42 miles. Afterwards, at paragraph 7, it is stated that the whole length of the canals is 1,363 miles *(i.e.,* as usual 681 miles on both banks. If we are to understand by this that only 42 miles out of this great length are available for the growth of trees, it would be desirable to explain the case in a few lines. Of the 42 miles, however, it would appear that 36 have been successfully completed.

Plants are usually put in at 30 feet apart, except on the Chenab bund, where the kikar is close. Six miles, *i. e.,* four in the bund and two on the river side of the Sikandarabád canal, are not complete owing to the flooding of the ground. Might not willows here be tried with success?

Some gaps were filled up in existing lines during the year.

II. Spoil Banks.

136. The area of spoil banks connot be given; nor can they here be sown, as the annual clearings would bury the trees. Trees have been tried at the toe of the *outer* slope, but the earth falling down buries them.

III. Chaukis.

137. So many have no wells that the trees are maintained with difficulty, only a few were planted at Bhinda Gargana Chauki:—

Financial.

138. *Income*—

Sale of wood	Rs. 1,739	
„ fruit, &c.	129	
„ Múnj and grass	3,141	——5,009
Expenditure—		
Planting	916	
Establishment	423	
Watering, &c.	340	——1,679
Surplus...	Rs.	3,330

Indus Canal (Dera Ghazi Khan).

139. Total length 1,334½ miles (including bund). Total planted 155½ miles.

To this was added druing the year 8¾ miles planted at 15 feet apart, chiefly shisham. Some mistake appears, as the new work of the year (besides the above) is spoken of as something in the future, though the year had closed when the report was sent in.

It is unfortunate, however, that the self-sown trees, which here are numerous and remarkable, are not taken into account.

Natural sowings.

140. Lengths and areas stocked naturally should be included in the "finished" portions, with a note saying how the stock was produced.

Sissu tallow tree (*execaria sebifera*), (*salvadora*) date palm, kikar, bír jand, siris, are the most abundant in the order in which they are stated.

II. Spoil Banks.

141. The spoil banks are apparently not sown, nor is the area known. I should have thought the self-sown trees would be on the spoil, but it seems not to be the case; on the other hand, it is difficult to suppose that they come in lines as avenues naturally.

III. Chaukis.

142. Nurseries are kept up to supply trees at six different chaukis, and other temporary ones where wanted.

28,600 young trees were raised.

IV. Financial and Working.

143, *Income*—

Sale of wood	...	...	...	Rs. 1,151	
„ grass	...	...	...	„ 42	—1,193
Expenditure—					
Establishment	...	...	...	„ 4,510	
Working	...	...	...	„ 550	
Maintenance, &c.	...	...	...	„ 778	—5,838
				Deficit... Rs.	4,645

The total number of self-sown tree diminished; this was owing to cutting to supply material for protective works, spurs, &c., against floods.

In some chaukis damage was done by river erosion and flooding.

144. Some trees were bent over by the wind, the ground having become soft by flooding on subsidence of the water. Many of these have been successfully restored to an upright position.

Sirhind Canal Main Line Division.

Avenues.

145. Total length 78 miles.

Planted do. *nil.*

Nor was any work done during the year; the water is not yet let on, and avenue-planting would be useless at present.

II. Spoil Banks.

146. Area sown already is 806 acres, of which 140 acres were sown during the year, leaving 365 acres, more or less, to be sown in future years.

The sowing is with mulberry, jáman, mango, tún and kikar, with some teak and *eucalyptus* (species?).

III. Financial.

147. Although no income is recorded, a quantity of brushwood has been supplied for making fascines. The expenditure on sowing was Rs. 1,004.

It is not intended to incur expenditure on line-planting, establishments, &c., till water let on. Sowing the spoil banks, as they are levelled off, is alone permitted at present.

3rd Division.

148. Total length available—

Combined branches	...	8 miles
Abohur do.	...	96 „
Battinda do.	...	24 „
	Total...	128 miles

I regret that the return is not understood. The total length of canal to be planted is 128 miles (taking both sides). It is said that 100 miles of this had already been planted, out of which 100 miles represented the work of planting done in the year under report. From the remarks opposite, I am doubtful whether I should infer that 18 miles have been entirely finished, three partly so, and that consequently79 miles (to make up the 100) have failed entirely. This is hardly likely to be the case.

II. Spoil Banks.

149. Area sown, ... 332 acres.
Added during the year ... 102 „
Remaining to be done ... 618 „

The sowings are broadcast of shisham and kikar.

On the Abohur branch sissu thrives particularly well. Locusts destroyed a large number of kikar on the 40th, 41st, 42nd, and 43rd miles. The system adopted is to sow by contract, full payment being made only after testing results.

III. Chaukis.

150. On miles 32 and 51, Abohur, and miles 12 and 22 on the Bhattinda branch, the chaukis are planted with sissu trees.

IV. Financial.

151. *Income*— *Nil.*

Expenditure—

Establishment	Rs.	81
Maintenance and working	„	477
Sowing spoil banks	„	692
Contingencies	„	8
	Rs.	1,258

Cultivation of castor oil.

152. The castor oil plant was experimentally cultivated on the Abohur branch. In places they have spread over the spoil banks, and this gives "a wild and neglected appearance." It is no doubt true that castor oil impoverishes the soil, and that it is anything but a good preparation for trees. On the other hand, it would be easy to keep the castor oil plants in order, and weed them out of irregular places. I have no means of judging how far the plant is desirable in localities spoken of in the report; but the S. P. and D. Railway have been spending money on watering and manure to, I believe, a considerable extent, for the express purpose of raising this plant (for the manufacture of oil used in lubricating machinery, and for ligthing also, so that it might turn out that spoil banks, covered with the "wrind," would prove highly remunerative when the fruit is gathered. This is worthy of consideration.

4th Division.

I. Line Planting (Avenue).

153. Total length ... ... 94 miles.
Length finished ... ... 0 „

No work was done but to start a "plantation" (nursery is apparently meant), which had 15,500 young shisham; of these 3,000 were put out along roads; apparently not on the canal line above indicated, or this would have stocked at 15 feet apart some 11 miles or so.

II. Spoil Banks.

154. The area is not stated, and no part of it has been planted or sown. A quantity of kikar, and five times as much of sissu seed, has been collected to be sown in trenches on the spoil along the lower 10 miles, "where the water is not too deep below the surface."

III. Chaukis.

155. Three chauki compounds have been planted with 200 shishams.

IV. Financial.

156. There is as yet of course no income, and the expenditure has been small, only Rs. 200.

6TH DIVISION.

I. Line Planting.

157. Total length 182 miles.

Gaggar Branch	108	miles.
2nd Feeder	4	„
3rd Feeder	20	„
Navigation Channel	10	„
Choa Branch	40	„
Total	182	miles.

Length successfully planted 29 miles. No new length was undertaken during the year, but the 29 miles previously put out were tended, These consist of some 10,700 trees,—siris, jáman, sissu, mulberry, and kikar. The height averaging three to six feet.

II. Spoil Bank (Plantation).

158. The area of spoil bank previously planted is *nil*, but during the year 1,439 acres were sown. Kikar plants, over 98,000 in mumber, are reported alive on the Gaggar Branch, besides smaller mumbers on the 2nd and 3rd feeders.

Frost and drought nearly destroyed the sowings on the Choa Branch.
815 acres still remain to be sown, thus—

Last 5 miles of Choa Branch ...	65	acres.
Gaggar Branch ...	696	„
Navigation Channel ...	54	„
Total	815	acres.

III. Chaukis.

159. Nine chauki compounds were planted, each with 200 trees, including fruit trees and the useful "nim." All are doing well.

Water is not yet admitted, and therefore line planting and other work is not permitted.

IV. Financial.

160. No income, of course, can be expected as yet.

The expenditure was Rs. 3,780, of which Rs. 72 was for gardeners, and the rest for sowing the spoil banks, which is cheap work, being a little over Rs. 2-8 an acre.

161. I may remark that wherever kikar sowings are undertaken there is no occasion to be dissatisfied if a considerable portion of the young seedling, that come up thickly, die off either by frost or white ants. It is in the nature of kikar to form an open growth, and it will be found that what looks like only a few trees remaining will in a short time form a quite sufficient cover. Re-sowing need only be resorted to wherever there are actually blank patches.

WESTERN JUMNA CANAL.

KARNAL DIVISION.

I. Line Plantation:

162. Total length 180 miles, also 70 miles on escapes and 80 miles on rajbuha.

From Dadupur, and including the road to Kherwán, but excluding secondary channels and escapes, &c.

Above Dadupur the canal can scarcely be said to have banks in the sense of an area available for line or area planting, and at other parts also there is no available space.

Nearly all this line has long ago been planted, and possesses fine trees. Only on some of the rajbuhas is planting still in progress.

II. Spoil Banks (Plantation).

163. There are no spoil banks, but there are plots of waste land, *viz.*, islands, old bends subsequently cut off by a straightened channel, lands taken up for protective works, and so forth. Of this area about

1,500 acres have been already planted, the remainder being let out for cultivation and grazing. Part is also being covered from time to time with trees; kikar is the chief tree, but sissu and other common trees are also abundant. A valuation in 1876, of the head subdivision only, gave 188,000 trees.

Near Dadupur there are sál and teak trees, and *pinus longifolia* growing side by side!

III. Chaukis, &c.

164. At Dadupur and at Karnál there are a few mango gardens.

The old chaukis are all planted up for shelter.

At Abdullapur and Radaur there are newer plantations, which required watering and care during the year.

IV. Financial.

165. *Income*—

Sale of wood	Rs. 1,946
„ fruit	290
By leases of cultivators	2,644
„ grazing	1,676
„ sale of grass	728
	Rs. 7,284

Expenditure—

Establishment of malís (a Forester has since been appointed) ... Rs. 150.
Working and contingencies (not given),

The statement has been sent incomplete, but it is evident that these plantations now yield a large profit. The sales of wood, however, are far smaller than those of the Bari Doab Canal.

New Main Line Division.

166. Total length of line { New Main Line ... 31 miles, New Hansi branch ... 12 „ } Total 43 „

Length operated on ... ... 19 „

Here there is no distinction between an *avenue* or *line* planting, and the sowing of *areas* on the levelled spoil banks. The 19 miles spoken of were done by sowing lines of sissu and kikar at 10 feet apart on the soil.

II. Plantations.

167. I am not sure whether I am to mention the 200 acres sown from mile 0 to mile 9, on spoil banks as separate from, and additional to, this or not.

III. Chaukis.

168. In Rampa compound, a nursery of cuttings of pipal, bor, and willow has been started.

I would not recommend "pipal" and "bor" as a rule for canal plantations, the wood is of no use. They may be desired, however, at chaukis or other places where shade and protection are the object.

IV. Financial.

169. This work was all under construction, and of course planting cannot be carried beyond a certain stage, and does not yield an income. The expenditure was Rs. 848, of which Rs. 73 was the pay of a Forester and a malí.

HANSI DIVISION.

170. Total length for planting 500 miles, including branches.

No line planting has been done, and there are no spoil banks fit for planting.

II. Chauki Compounds.

Only one garden at Botána was added to during the year, 117 mango trees being planted.

171. I do not, I confess, understand this report, though there are neither lines of trees nor spoil banks sown or planted, and nothing was done except to plant 117 mangos at Batána. In the expenditure Rs.195 for planting trees at Hissar appears; under each canal (Hánsi, Rohták and Batána) small sums appear as *cost of counting trees;* while, strangest of all, the large sum of Rs. 1,571 appear for collecting and stacking wood. The total result was—

Income—			
Timber	Rs.	5,620	
Fuel	„	2,104	
Charcoal	„	147	
Fruit	„	78	
Grass, &c.	„	55	—8,004
Expenditure—			
Maintenance and contingencies	„	476	
Collecting and stacking wood	„	1,571	—2,046
Surplus Rs. ...		5,958	

172. These are the concluding "General remarks":—

"As shown above, nothing has been done during the year under review towards new plantations. The old trees are dying off fast; numbers fall annually. Those growing on the canal berms rot at the roots through excess of moisture, and fall; the timber produced is very bad and fit only for firewood. I consider it quite useless to attempt to grow trees upon the canal berms, swamped as they are for the most part with water. The line trees are differently situated; but if new ones are planted to fill up gaps, the monkeys at once destroy them. Kikar seems the only tree that would be able to escape the ravages of these pests."

DELHI DIVISION.

1*st Subdivision.*

173. Total length for planting, 74 miles { No. IX Rajbuha 30 miles; No. XII Do. 44 „ } = 74 miles.

Total finished, 10 miles; still incomplete 64 miles.

The details of the work in the 10 miles on Rajbuha IX show good growth; but three miles on Rajbuha XII attempted this year are not looking very promising.

This leaves 20 miles on IX, and 44 on XII, unless the three miles succeed after all.

II. Spoil Banks.

174. There are only 360 acres of spoil banks not sown.

IV. Chaukis.

175. There are fruit gardens at Naultha, Sardána, Rohtak, and Palsi, and one of grafted mangos at Isrána, a new compound at Sarag that was planted with fruit trees during the year.

Financial.

176.

Income—			
Sale of wood	Rs.	389	
„ fruit	„	218	—607
Expenditure—			
Establishment	„	254	
Work and contingencies	„	123	—377

(2ND SUBDIVISION.)

Line Planting.

177. Total length, 82 miles, all complete and well-wooded, mostly shisam, jáman, kikar, and mulberry.

II. Plantations.

178. There are 497 acres sown over with trees of the same kind.

III. Chaukis.

179. There are here also several fruit gardens, which call for no remark.

IV. Financial.

180. *Income*—

Sale of wood	Rs.	2,832
„ fruit	„	554
Total	Rs.	3,386
Expenditure—		
Contingencies and tending fruit gardens (no establishment) ...	„	69
Surplus	Rs.	3,317

Since 1874 no operations have been carried on; the gardens are taken care of without *fixed* establishment. Monkeys here infest the lines and destroy seedlings.

NEW DELHI BRANCH.

181. Total length available is 65·7 miles; of this, three miles on one bank has been planted. No spoil bank area has yet been sown.

At chauki compounds only 170 mulberry trees have been planted ; but whether there are any other existing gardens does not appear.

There is no income, and the expenditure is only Rs. 321.

The earth is not settled enough yet on the spoil banks to make sowing advisable.

182. In all reports it is noticed that little or no account of chauki compounds is taken. It might be noted that the total number is so and, so, each having a certain area, if that can be given, or a certain number of trees; that so many have *fruit* groves and so many timber or ordinary trees. The number of special fruit gardens on the Western Jumna Canal line might also be stated, as well as the new areas added.

H. B. BADEN-POWELL,

Conservator of Forests,

Punjab.

APPENDICES.

Arboriculture Statement of the Punjab Districts for the year 1878-79.

Tahsíl.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted, but failed altogether.	4 Work of previous year which still requires completion.	5 Going over or completing old work.	6 New work.	7 Remarks.
				PESHAWAR. *Roads.*			
Pesháwar ... (dry 20 inches).	1	Length of road undertaken in the year (49 miles).	13	36	Blanks filled on (?) miles. (10,070 trees).	Planted up miles? (6,800 trees.	
Mardán ... (dry 24 inches).	2	Do. 100 miles ...	71	29	Do. miles ? (4,593 trees).	miles ?	About 800 failed.
Hashtnagar ... (dry 19 inches).	3	Do. 23 miles ...	16	...	Do. miles ? (1,363 trees).	...	
Doába Daudzai ... (dry 21 inches).	4	Do. 53 miles ...	14	39	Do. miles ? (5,590 trees)	...	
				Groves and Plantations.			
Pesháwar ...		Jail and encamping ground.	...	...	...	334 trees ...	Success.
Mardán ...		At Schools, Rustam and Mardán.	...	...	...	118 „ ...	Do.
Hashtnagar ..		At Charsadda School ...	...	...	...	204 „ ...	Do.
				DERA GHAZI KHAN *Roads.*			
Dera Gházi Khan.	1	Ditto 174 miles ...	159	15 miles ...	11 miles ...	...	Work confined to filling blanks caused by the flood, and was partially successful.
Jámpur ...	2	Ditto 40 miles ...	34	6 „ ...	4 „ ...	...	
Rájanpur ...	3	Ditto 11 miles ...	...	11 „ ...	6 „ ...	...	
				Groves and Plantations.			
Dera Gházi Khan	4	Kotla Sikháni rakh ...	...	...	20 acres in two plots.	...	Re-sown after destruction by flood, partially successful.
		6 nurseries ...	...	...	...	Several thousand plants.	

			RAWALPINDI. *Roads.*				
Rawalpindi ...	1	Ditto 2 miles ...	2	...	...	922 trees ...	Shisham.
Attock ...	2	Ditto 17 „ ...	4	13	1,720*	1,440 „ ...	* All failed for want of rain.
Pindigheb ...	3	Ditto 88 „ ...	7	81	...	277 „ ...	Out of this 160 failed.
Kahuta ...	4	Ditto 132 „ ...	100½	31½	...	3,302 „ ...	All succeeded.
Fatahjang ...	5	Ditto 98 „ ...	59	39	...	2,933 „ ...	Of which 1,125 failed.
			Groves and Plantations.				
Kahuta ...		Tahsíl compound ...	...	...	...	65	60 trees failed.
Fatahjang ...		Ditto ditto ...	...	...	...	80	20 „ „
Ditto ...		Ditto ditto ...	...	...	...	15	12 „ „
Ditto ...		Garden and dispensary ...	...	...	...	53	Of which 5 failed.
			JHELUM *Roads.*				
Jhelum ... (rain-fall) ?	1	Length of road undertaken in the year ?	20 miles ...	miles ? ...	miles? (1,925 trees).	miles? (1,114 trees).	980 trees failed.
Pind Dadan Khan	2	Ditto 61 miles	36 „ ...	25 miles ...	miles? (7,206 „)	miles ? (3,975 „)	Failure 2,480 trees.
Talagang ...	3	Ditto ?	13½ „ ...	miles ? ...	miles? (2,626 „)	miles? (2,040 „)	820 trees failed.
			Groves (not distinguishable in return).				
			GUJRAT *Roads.*				
Gujrát ...	1	Ditto 25 miles and some station roads.	?	?	8 miles	1½ miles	New fencing and watering of young trees and replacing here and there withered trees. Succeeded.
			SHAHPUR *Roads.*				
Shahpur (dry 21 inches).	1	Ditto 7 miles and some station roads.	7 miles	...	miles? (945 trees).	miles? (1,000 trees).	
Bhera ... (dry 11 inches).	2	Ditto 38 miles	6 „	32 miles ...	3 miles (1,600 trees).	...	Out of this 890 failed owing to drought.
Khushab ... (dry 13 inches).	3	Ditto 51 miles	40 „	11 „ ...	miles? (4,000 trees).	2 miles (3,200 trees).	9th and 10th mile *double* row on either side.
			Groves and Plantations.				
Shahpur ...	...	Tahsíl compound ...	...	...	...	1 grove area ? ...	Kikar and shisham partly successful.
Bhera ...	...	4 groves on Gujrát road...	...	...	15,725 trees ...	...	Ditto.
Khushab ...	...	Grove 2 kanals near Sodhi Garden.	...	...	...	2 kanals ...	Successful.
...	...	Tahsíl compound ...	...	...	...	200 trees ...	These all failed.

Arboriculture Statement of the Punjab Districts for the year 1878-79.—Continued.

Tahsíl.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted, but failed altogether.	4 Work of previous years which still requires completion.	5 Going over or completing old work.	6 New work	7 REMARKS.
			GUJRANWALA.				
			Roads.				
Gujránwála ... (dry 25 inches).	1	Tahsíl compound 83 miles	32 miles ...	43 miles ...	43 miles ...	...	On the whole fairly successful.
Wazirabad ... (medium 34 inches)	2	Ditto 27 „ ...	13 „ ...	14 „ ...	...	9 miles (2,120 trees)	530 trees failed.
Háfizabad .. (dry 27 inches).	3	Ditto 92 „ ...	77½ „ ...	14½ „ ...	14½ miles ? ...	...	Partial success.
			Groves and Plantations.				
Gujránwála ...		Nurseries ...	...	...	...	3 plots ?	On roads ratioting from civil station (success).
Wazirabad ...		At sarai ...	2 acres ...	Some blanks ...	?	?	
			LAHORE.				
			Roads.				
Lahore ..	1	Length of road undertaken in the year, 15 miles.	4 miles ...	11 miles ...	4 miles blanks filled.	...	With partial success on 2 miles ; rest success.
Sharakpur ...	2	Ditto 69 miles	55 „ ...	14 „ ...	14 miles ditto	...	Apparently the gaps on the 14 miles planted were all filled.
Chunián ...	3	Ditto 69 „	41 „ ...	28 „ ...	23 miles ditto	1 mile.	
			FEROZEPORE.				
			Roads.				
Ferozepore ...	1	Ditto 75½ „	27½ „ ...	48 miles ...	miles ? blanks filled (18,421 trees).	miles (2,514 trees)	Original return not intelligible, as some miles are entered both as successful and partially successful ; it is understood that in every such piece some blanks were successfully filled ; others failed.
Moga ...	2	Ditto 31 „	8¼ „ ...	22¾ „ ...	22¾ miles ? ...	...	
Zírah ...	3	Ditto 107 „	59 „ ...	48 „ ...	...	miles ? (with 8949) trees.	63,124 trees failed.
Muktsar ...	4	Ditto (?)	100 „ ...	?	miles ? filled with trees.	miles ? (3,210 trees)	

				Groves and Plantations.			
Ferozepore ...		15 groves or plots ...	...	...	...	acres ? (1,719 trees)	Only a few failures of these groves, 9 are at intervals on the Grand Trunk Road, the rest at various places in the tahsíl.
Moga ...		Two groves ...	...	...	...	47½ trees ...	Partial success.
Zírah ...		3 groves ...	...	...	...	17½ trees ...	Ditto.
Muktsar ...		10 groves ...	...	20 acres	...	acres ? with trees.	Each grove contained some trees, and were added to in the year.
				MONTGOMERY. *Roads.*			
Dipálpur ...	1	Ditto 38 miles	32 miles ...	6 miles ...	miles ? (blanks filled with 540 trees)	...	These 540 trees all failed.
Pákpattan ...	2	Ditto 29 miles	28 „	1 mile ...	miles ? (blanks filled with 71 trees)	...	Do. do all failed.
				Groves and Plantations.			
Montgomery station.		Various places ...	...	...	6,993 trees ...	1,661 trees ...	Includes trees planted at Dák Bungalow Kutcherry.
Chíchawatni ...		Dák Bungalow ...	...	...	1 acre existing 151 blanks filled.	30 new trees ...	Church and city gardens, &c.
Dipálpur ...		Attári ...	...	9 acres already ...	1,019 ditto	acres ? 2,980 trees	Of these 324 trees died. New trees added to the previous plot of 9 acres.
...		Tahsíl garden ...	...	...	1,916 trees ...	...	
Gugera (station)...		1 plot (8 marlas) ...	...	...	...	2,000 trees	1,700 failed out of this lot.
...		At 16 different places ...	...	...	5,318 „ ...	...	Small groups of trees throughout the tahsíl.
				MOOLTAN. *Roads.*			
Mooltan ...	1	Ditto 47 miles	18 miles ...	29 miles incomplete with blanks	miles ? blanks filled with 598 trees.	...	f these 83 died.
Shujabad ...	2	Ditto 12 „	10 „ ...	2 ditto ditto	2 miles blanks filled (100 trees).	...	
Lodhrán ...	3	Ditto 130 „	68 „ ...	62 ditto ditto	34 miles (1,284 trees).	...	Failure 642 trees.
Mailsi ...	4	Ditto 65 „	40 „ ...	15 ditto ditto	17 miles (1,227 trees).	...	Failure 477 trees.
				Groves and Plantations.			
Lodhrán ..		At tahsíl ...	...	1½ acres ..	2,205 trees ...	...	Is this a new addition or a re-stocking of the old 1½ acres !
Jalálpur thána ...		Thana ...	...	½ an acre ...	...	1,000 trees.	
Sarai Sidhu ...		At Tahsíl ...	...	½ an acre ...	trees ...	...	Seedlings of kikar, shisham and siris; 1,000 failed out of these.

Arboriculture Statement of the Punjab Districts for the year 1878-79.—Continued.

Tahsíl.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted, but failed altogether.	4 Work of previous years which still requires completion.	5 Going over or completing old work.	6 New work.	7 Remarks.
			JHANG.				
			Roads.				
Jhang ... (dry 21 inches).	1	Length of road undertaken in the year 101 miles.	91¾ miles ...	9¼ acres ...	9¼ miles all blanks filled with 547 trees.	...	With success.
Chiniot ... (dry 9 inches).	2	Ditto 52 miles	50 „ ...	2 „ ...	2 miles all blanks filled with 279 trees.	...	
Shorkot ... (dry 19 inches).	3	Ditto 34 „	32 „ ...	2 „ ...	Do. (513 trees)	...	
			Groves and Plantations.				
Jhang ...		Sadr garden ...	5 acres ...	...	...	12 poles with 7,369 trees.	(Cuttings).
Shorkot ...		Tahsíl garden ...	2 „ ...	...	...	15 poles 30 trees)	*Note.*—The "chaks" are alluded to in the Narrative, and are not entered in this table.
			MUZAFFARGARH.				
			Roads,				
Muzaffargarh ... (dry 11 inches).	1	Ditto 82 miles ...	57 miles ...	25 miles ...	13 miles blanks filled.	1 miles 00 trees	With partial success.
Alipur ... (dry 11 inches.	2	Ditto 53½ „ ...	33½ „ ...	20 „ ...	5½ miles ditto	...	40 trees destroyed on account of flood.
			Groves and Plantations.				
Muzaffargarh ...		At tahsíl ...	½ acres ...	...	...	83 trees ...	Of shisham and plot completed (?).
		Dispensary ...	¼ acres ...	...	...	80 ...	Ditto ditto.
		Telehri garden ...	...	26 accres ...	...	11 fruit trees ...	5 died on account of frost.
Sinánwán ... (dry 10 inches).		Kotádu camping ground ...	2 acres ...	...	..	32 trees (shisham)	108 trees had been planted; but failed on account of bad soil and drought.

			SIALKOT.				
			Roads.				
Zafarwál ...	1	Ditto 16 miles ...	...	16 miles but blank.	5 miles blank filled with (6,140 trees.)	...	No new work was taken up this year on account of drought.
Pasrúr ...	2	Ditto 108 „ ...	7	101 „ ditto ...	101 miles with 9,816 trees,	...	
Raya ...	3	Ditto 89 „ ...	23	66 „ ditto ...	20 miles blanks filled with 3,580 tree	...	These mostly succeed. On the 46 other miles attempts to fill blanks failed.
Siálkot ...	4	Ditto 48 „ ...	5	43 „ ditto ...	33 miles with 6,500 trees.	..	12 miles of this was perfect success, and 21 still left blanks.
			Groves and Plantations.				
Pasrúr ...		Tahsíl garden ...	...	1 rood ...	100 trees.	..	
„		Gulu Shah Fair ...	...	?	40 trees.	...	
			AMRITSAR.				
			Roads.				
Amritsar ...	1	Length of road undertaken in the year 53½ miles.	29½ miles ...	19 miles ...	miles all blanks filled with (1,014 trees).	5 miles plated with 1,482 trs.	210 trees failed of new work.
Tarn Taran ... (dry 24 inches)	2	Ditto 32 „ ...	20 „ ...	12 „ ...	miles ? with 531 trees.	...	
Ajnála ... (dry 22 inches)	3	Ditto 51 „ ...	26 „ ...	25 „ ...	miles ? with 1,069 trees.	...	182 trees failed.
			Groves and Plantations.				
			(None.)				
			GURDASPUR.				
			Roads.				
Gurdáspur ... (medium 30 inches)	1	Ditto 76 „ ...	20 miles ...	56 miles ...	5miles blanks filled with 625 trees.	...	(District statement unintelligible.)
Batála ... (dry 25 inches).	2	Ditto 47 „ ...	9 „ ...	38 „ ...	25 miles with 416 trees.	9 miles (nearly all failed).	Out o. the 416 trees planted, 359 are alive. 60 trees only on the 9 miles survived owing to the drought.
Shakargarh ... (medium 39 inches)	3	Ditto 62 „ ...	31 „ ...	31 „ ...	31 miles with 2,110 trees.	31 miles with 1,400 trees.	All blanks were filled in by 2,100 trees, of which only 80 died. New work all successful.
Pathánkot ... (medium 50 inches)	4	Ditto 47 ...	17 „ ...	30 „ ...	...	17 miles with 378 trees.	Success.

Arboriculture Statement of the Punjab Districts for the year 1878-79.—Continued.

Tahsíl.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 Number of miles still unplanted or planted, but failed altogether.	4 Work of previous years which still requires completion.	5 Going over or completing old work.	6 New work.	7 Remarks.
				Groves and Plantation.			
Gurdáspur ...	1	Government garden ...	...	17½ acres.	2,600 trees added	...	Of these 1,100 died.
...	2	Tún groves ...	...	3 acres.	334 trees added	...	Of these 40 died. Understood this to be a grove, *not* a nursery, to supply seedlings to other places.
...	3	Mango gardens ...	...	3 acres.	30 trees	...	
				KANGRA, *(Roads.)*			
Núrpur ... (85 inches).	1	ditto 95 inches ...	52	43	39 miles blanks filled, 20 of these miles, were completed.	6 miles (failed).	2,295 trees died on new work on account of dry season.
Kángra ... (75 inches.)	2	ditto 77 „ ...	32	45	41 miles completed	...	No rain-fall at the planting season. Lenere trees were not planted during the year.
Dera ... (76 inches).	3	ditto 93 „ ...	48	45	16 miles do.	...	29 miles attempted failed altogether.
Hamirpur ... (51 inches).	4	ditto 127 „ ...	78	49	43 miles do.	9 miles with 1,100 trs.	6 miles replenished (besides this) failed. Of new work one mile failed altogether.
Pálampur ... (112 inches).	5	ditto 66 „ ...	46	26	?		
Kulu ... (58 inches).	6	ditto 178 „ ...	32	...	...	...	No work at all.
				Groves and Plantations.			
				(Nurseries and groves mentioned in the Narrative).			
				JULLUNDUR. *Roads.*			
Jullundur. ... (medium 43 inches).		Length of miles 34¼ ...	...	34¼ blanks to be filled.	18¾ miles, gaps filled up.	...	With shisham and mango.

Nakodar ... (medium 44 inches)		Ditto 18 ...	8	6 do. do.	2½ miles ditto	4 miles (2,000 trees)	All successful.
Phillour ... (medium 34 inches		Ditto 57½ ...	30¼	7 do. do.	7 ditto ...	4¾	Do. do. New work partially so.
Nawashahr ... (dry 27 inches)		Ditto 27½ ...	5	21½ do. do.	9 ditto ...	1 mile ...	The 'plum" trees spoken of I presume to be "*bér*."
				Groves and Plantations.			
				(*see* Narrative Note also).			
Phillour ...		Village plantations at Gulábwala and Saif-a-bád.	...	acres ?	1,600 trees	...	
Nawashahr ...		Camping ground ...	...	acres ? ...	285 trees ...	...	
...		Village plantations at Hasaripur and Patiála.	...	acres ? ...	679 trees ...	...	Including date palms.
				LUDHIANA DISTRICT.			
				Roads.			
Ludhiána ...	1	Length of road undertaken 42 miles.	7½ miles ...	miles ? requiring to be replenished ?	miles ? blanks filled with 669 trees miles ?	1 mile ? ...	The one mile was planted with bôr trees. It is impossible to know from the District Statement whether the miles gone over during the year had *all* blanks filled and were done with or only partly so.
Jagraon ...	2	Ditto 30 miles	14 miles ...				
Samrála ...	3	Ditto 9 „	?	miles ? ...	miles ? 100 trees	...	
				Groves and Plantations.			
...		Sarai Lashkari Khan ...	...	?	200 trees planted	...	Apparently added to a *previously existing* grove of some kind.
				KARNAL DISTRICT.			
				Roads.			
Karnál ... (dry 24·3 inches)	1	Total length of the road undertaken 80½ miles.	42½ miles ...	miles ? still requiring blanks to be filled up.	29 miles blanks filled.	1 mile with 220 trees.	In the District Statement the columns give no *figures*, but each contains a narrative description ; hence it is very doubtful whether the *figures* here extracted are correct. On roads we only care to deal with length, which are either *complete*, partly complete, or wholly unplanted.
Pánipat ... (dry 24·2 inches.)	2	Ditto 42 miles	27 miles ...	miles ? ditto	5 miles ditto (with 1,085 trees.)	11 miles (but 6 failed.)	
Kaithal ... (dry 22·4 inches.)	3	Ditto 64 miles	58 miles ...	6 miles ditto	„	17 miles, but 15 failed.	
				Groves and Plantations.			
				(None apparently, nurseries for supply of young plants are noticed in the Narrative.)			

Arboriculture Statement of the Punjab District for the year 1878-79—Continued.

Tahsíl	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted, but failed altogether.	4 Work of previous years which still requires completion.	5 Going over or completing old work.	6 New work.	7 Remarks.
		GURGAON DISTRICT.—*Roads.*					
Gurgaon ... (dry 26½ inches).	1	Length of road undertaken 33 miles.	8½	19¼ with blanks here and there to be filled.	8½ miles; blanks filled.	...	3½ miles of this failed.
Nuh ... (dry 18½ inches).	2	Ditto 21 miles	16	5 ditto	...	...	Old work maintained.
Ferozepore (dry 16¼ inches)	3	Ditto 14 miles	9	5 ditto	...	...	Ditto ditto.
Palwal ... (dry 18 inches).	4	Ditto 17 miles	9	8 ditto	7 miles ditto	...	Success only partial on 6 miles.
		Groves and plantations.					
Gurgaon ...		Jhursa Bund ...	...	...	280 trees	...	75 failed.
Nuh ...		Taora Pohir Rest House ...	...	...	2,000 „	...	
Ferozepore ...		Committee House ...	...	...	680 „	...	
Palwal ...		Plot at Tahsíl ...	...	...	1,645 „	...	*Besides* this 655 were planted and failed.
...		On 3 encamping grounds...	...	...	415 „	...	
		[*Nurseries* intended only to produce young trees which are to be *taken away* to groves, avenues, &c., are not either groves or plantations: they are not permanent, or if they are, the trees are always being removed and renewed in the state of seedlings].					
		DELHI DISTRICT.—*Roads.*					
Delhi (Rain-fall ?)	1	Total length undertaken in year, 36¾ miles.	29 miles ...	? miles ...	23 miles; blanks filled but nearly all failed.	1 mile with 450 trees	New work succeeded; the replenishing nearly all failed.
Ballabgarh ... (?)	2	Ditto 46 miles	42 miles ...	4 miles with blanks requiring to be filled	33 miles replenishing blanks.	...	Replenishing nearly all failed.
Sonepat ... (?)	3	Ditto 28½ miles	15½ miles ...	13 miles ditto ...	12 miles ditto ...	...	All failed but ½ a mile.

			Groves and Plantations.				
Delhi ...	...	School-house at Nagloi, Jatan.	...	...	50 trees ...	...	Successful.
...		Mubárik Bágh ...	...	...	1 biga ...	...	4,700 trees successful.
Ballabgarh ...	...	Fort compound ...	...	...	...	1,400 trees ...	Successful
			HISSAR DISTRICT.				
			Roads.				
Hissar Tahsíl ... ("arid" rainfall ?)	1	Length of road undertaken yearly 41 miles.	11 miles ...	30 miles with blanks requiring to be filled.	20 miles *	...	* Nearly all failed.
Hánsi ... (?)	2	Ditto 109 ...	94½ „ ...	14½ ditto ...	8 miles with 758 trees.	...	Only partially successful.
Bhawáni ... (?)	3	Ditto 7 ...	6½ „ ...	½ ditto ...	½ mile with 302 trees.	...	Successful.
Fatahabad ... (?)	4	Ditto 28 ...	26 „ ...	2 ditto ...	1 mile with 694 trees.	...	Partially successful.
Bherwala ... (?)	5	Ditto 39 ...	36¾ „ ...	2¼ ditto ...	2 miles (failed) ...		
			Groves and Plantations.				
Hissar ...		...	...	...	(*see* Narative Report para. 116.		
			ROHTAK DISTRICT.				
			Roads.				
Rohták ... (dry 21 inches).		Ditto 60½ ...	40¾ miles ...	14 miles (?) with blanks to be filled.	10 miles replenished.	1 mile with 650 trees.	Work mostly successful.
Sampla ... (dry 22 inches).		Ditto 55½ ...	42½ „ ...	10 miles do.	10 ditto ...	1 mile with 412 trees.	Ditto ditto.
Gohane ... (dry 23 inches).		Ditto 56 ...	29 „ ...	27 „ do.	27 ditto ...	...	Mostly successful.
Jhajjar ... (dry 20 inches).		Ditto 65 ...	48¾ „ ...	4 „ do.	4 ditto ...	7 miles do.	Both "replenishment" and new work were only partly successful.

Arboriculture Statement of the Punjab Districts for the year 1878-79.—Concluded.

Tahsíl.	1 Serial number.	2 Name of road or locality (total length in miles omitting fractions given in bracket).	3 No. of miles still unplanted or planted but failed altogether.	4 Work of previous year which still requires completion.	5 Going over or completing old work.	6 New work.	7 Remarks.
				Groves and Plantations.			
				(None reported.)			
				Sirsa District.			
				Roads.			
Sirsa ... (dry 23·4 inches).	1	Length of road undertaken yearly 54 miles.	49 miles ...	5 miles having blanks to be filled up.	4½ replenished ...	1 mile with 41 trees.	With partial success.
Dabwala ... (dry 17·4).	2	Ditto 44 ...	14 miles ...	30 ditto ...	Ditto ...	...	No avenues, but groves at intervals.
Fazilka ... (dry 17·8 inches).	3	Ditto 46 ...	...	46 ditto ...	miles ? replenished with 115 trees.	...	Out of the replenishments about half died.
				Groves and Plantations.			
Sirsa ...	1	Dhanni ...	...	1 acre ...	700 trees ...	...	Of which 200 died.
		Sirsa ...	...	1 acre 25 poles...	...	...	No new work done.
		Various villages ...	...	506 trees previously.	259 trees ...	...	To fill gaps (50 of these died).
Dabwalla ...	2	Plots at villages ...	...	100 trees do.	200 „ ...	...	

Proceedings of the Hon'ble the Lieutenant-Governor of the Punjab, in the Revenue, Agriculture and Commerce Department (Forests), No. 493F., dated 18th November 1879.

READ—

The report of the Conservator of Forests on the Arboriculture of the Punjab for 1878-79.

RESOLUTION.—The reports of certain districts and canals were submitted very late to the Conservator, who was thus prevented from compiling the provincial report at an early date. The Lieutenant-Governor desires that all Commissioners will take care that, for the future, the district returns are submitted punctually so as to reach the Conservator by 15th June at the latest.

2. For the future, the form of the district reports will be that of which an example filled up is given by Mr. Powell in paragraphs 2 and 3 of his report. By making this return of the same form exactly as the provincial one, a great deal of trouble in compilation of the latter may be avoided.

3. In submitting the next yearly return, all District Officers should be careful to carry out the suggestions of the Conservator on these points exactly.

4. The proposal that Native Overseers should be sent to the Changa Manga plantation to acquire a rough knowledge of practical arboriculture commends itself to the Lieutenant-Governor, and the suggestion may well be urged on the attention of District Committees by the District Officers. By this method a number of Supervisors with a sufficient knowledge of the subject to avoid at least all unprofitable experiments may be obtained at a very small cost.

5. The Lieutenant-Governor considers that the subject of district arboriculture is one of the greatest importance to the prosperity of the country and the convenience of the public, and if the matter is carefully managed, it will almost everywhere return a considerable profit on the outlay made. The suggestions and remarks of the Conservator are of the greatest value for the guidance of District Officers, and the Lieutenant-Governor desires that the Commissioners of Divisions will see that his recommendations are carefully observed in all districts.

6. The Conservator of Forests took up this subject a few years ago at the special request of Government, and has devoted much attention to it, which, the Lieutenant-Governor trusts, will produce good results if the attention of the district authorities is properly given to the matter. His Honor desires to convey his acknowledgments to Mr. Powell for his valuable and suggestive report.

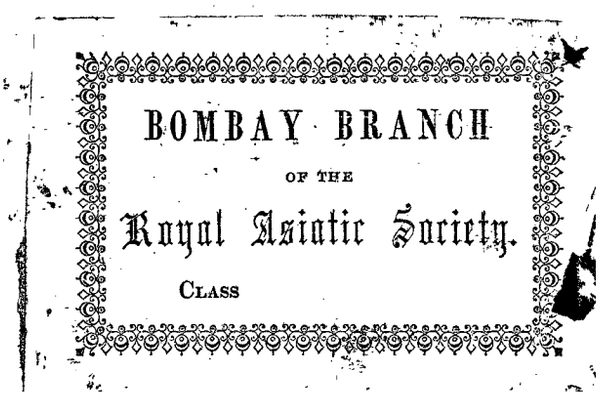
ORDER.—Ordered that the above Resolution be printed and published in the *Punjab Gazette*, and that copies be forwarded to the Financial Commissioner, Irrigation Department, Public Works Department, all Commissioners and Deputy Commissioners, and separate copies to all first class Municipalities and District Committees, for information and guidance.

By order of the Hon'ble the Lieutenant-Governor of the Punjab,

LEPEL GRIFFIN,

Secretary to Government, Punjab.

Printed at the Punjab Government Civil Secretariat Press, Lahore,—27-11-79.


BOMBAY BRANCH
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PROGRESS REPORT

OF

DISTRICT AND CANAL ARBORICULTURE

IN THE

PUNJAB

FOR

1879-80,

LIBRARY
OF THE
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COMPILED BY

W. SCHLICH, Esq., Ph. D.

CONSERVATOR OF FORESTS;

WITH A REVIEW BY H. H. THE LIEUTENANT-GOVERNOR OF THE PUNJAB.

Lahore:

PRINTED AT THE CENTRAL JAIL PRESS,

1880.

BOMBAY BRANCH
OF THE
Royal Asiatic Society.
2½ CLASS

No. 505F.

FROM

W. M. YOUNG, ESQUIRE,

Secretary to Government,

Punjab and its Dependencies,

To

DR. W. SCHLICH,

Conservator of Forests, Punjab.

Dated Lahore, 9th December 1880.

Revenue, Agriculture and Commerce.
(Forests.)

SIR,

I am directed to acknowledge the receipt of your letter, without number, of the 20th November, forwarding the Annual Report on District and Canal Arboriculture in the Punjab for the year 1879-80.

2. The Lieutenant-Governor observes that no reports have been received from the Simla, Kohat or Lahore Districts, and that those submitted by the Deputy Commissioners of Ludhiana, Rawalpindi, Jhelum, Gujrat, Jhang, and Bannu, are exceedingly meagre. The attention of the Commissioners of the Divisions in which the above districts are situated will be drawn to the points noticed.

3. The Lieutenant-Governor regrets to see that too little attention is paid by District Officers to the instructions which have been repeatedly issued and to the remarks of the Conservator in his reports to Government. The fact that all mention of the detail of expenditure on arboriculture and the income derived therefrom is omitted from the reports of several districts, is enough to prove this, and His Honor considers that if the Conservator would draw up a list of the topics for his report which should be treated by Deputy Commissoners, this would show District Officers how the subject should be dealt with and secure uniformity in reporting. I am accordingly to request that this may be done in order that instructions may be issued by Government to Deputy Commissioners on the subject.

4. The success which has attended arboricultural efforts during the year in the Dehli, Jullundur, Hoshiarpur, Mooltan, Muzaffargarh and Dera Ismail Khan Districts has apparently been considerable. It would seem that nurseries are being established in many districts, and this is no doubt a very necessary work. The Lieutenant-Governor will be glad to learn in future reports how far the planting of roads across the Hoshiarpur "chos" has been successful.

I have, &c.,

W. M. YOUNG,

Secretary to Government, Punjab.

Printed at the Punjab Government Civil Secretariat Press, Lahore.—21-12-80.—205.

PROGRESS REPORT

OF

DISTRICT AND CANAL ARBORICULTURE

IN THE

PUNJAB

FOR

1879-80,

COMPILED BY

W. SCHLICH, Esq., Ph. D.

CONSERVATOR OF FORESTS;

WITH A REVIEW BY H. H. THE LIEUTENANT-GOVERNOR OF THE PUNJAB.

Lahore:

PRINTED AT THE CENTRAL JAIL PRESS,

1880.

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27.	Dera Ismail Khan „	12
28.	Dera Gházi Khan „	13
29.	Bannu „	*ib*
30.	Peshâwar „	*ib*
31.	Hazára „	14
32.	Kohát „	*ib*

II.—CANAL ARBORICULTURE.

1.	Bari Doáb Canal, 1st Division	15
2.	Do. do. 2nd „	*ib*
3.	Upper Sutlej Inundation Canals	16
4.	Lower Sutlej and Chenab Inundation Canals	17
5.	Indus Canals (Dera Gházi Khan)	*ib*
6.	Sirhind Canal, Main Line Division	18
7.	Do. do. 3rd do.	*ib*
8.	Do. do. 4th do.	*ib*
9.	Do. do. 5th do.	*ib*
10.	Western Jumna Canal, Karnál Division	19
11.	Do. do. Hánsi „	*ib*
12.	Do. do. Delhi „	20
13.	Do. do. New Delhi Branch Division	21
14.	Muzaffargarh Canal Division	*ib*
15.	Swat ditto	*ib*

APPENDIX.

Arboriculture Statement of the Punjab Districts for the year 1879-80.

No. 472 C. L., dated Simla, 25th September 1880.

From—Dr. W. SCHLICH, Conservator of Forests, Punjab.
To—The Secretary to Government, Punjab.

I HAVE the honor to submit herewith, for His Honor the Lieutenant Governor's information, the report on "District and Canal Arboriculture for the year 1879-80."

2. Being new to this Province, I have restricted myself to giving the local reports arranged, as far as practicable, in an uniform manner, without adding any remarks of my own.

3. The expenditure on District Arboriculture during the year under review is as follows:—

DIVISION.	District.	Amount expended.	REMARKS.
		Rs.	
DELHI ...	Delhi	3,102	
	Gurgaon	2,412	
	Karnál	3,228	
HISSAR ...	Hissar	3,427	
	Rohtak	4,033	
	Sirsa	663	
UMBALLA ...	Umballa	2,048	
	Ludhiána	7,999	
	Simla	...	Blank.
JULLUNDUR ...	Jullundur	1,810	
	Hoshiárpur	...	Not given.
	Kángra	797	
AMRITSAR ...	Amritsar	6,930	
	Gurdáspur	5,353	
	Siálkot	2,743	
LAHORE ...	Lahore	...	Not given.
	Ferozepore	...	Ditto.
	Gujránwála	3,728	
RAWALPINDI ...	Rawalpindi	...	Ditto.
	Jhelum	7,280	
	Gujrat	570	
	Shahpur	2,719	
MOOLTAN ...	Mooltan	2,071	
	Jhang	2,954	
	Montgomery	1,828	
	Muzaffargarh	4,010	
DERAJAT ...	Dera Ismail Khan	1,038	
	Dera Gházi Khan	4,034	
	Bannú	1,079	
PESHAWAR ...	Peshàwar	6,477	
	Hazára	...	Not given.
	Kohát	...	Blank.
	Total of 25 districts ...	82,335	

Total of 25 districts	Rs.	82,335
Add for 5 districts (Hoshiárpur, Lahore, Ferozepore, Rawalpindi and Hazára) for which the expenditure has not been given, the average of the above 25 districts ...	„	16,467
Total of 30 districts ...	„	98,802

(Two Districts Simla and Kohát are blank.)

Thus, about one lak of Rupees, in a round sum, has been expended during the year on District Arboriculture, and the question arises, whether not a more satisfactory professional supervision could be provided, than has been possible hitherto.

4. It has been arranged to train Overseers and Mális at Chánga Mánga in a systematic way, beginning from the 1st November 1880, and by these means it is hoped an efficient subordinate establishment may gradually be obtained for District and Canal Arboriculture. As regards superior supervision, it

may hereafter, when the settlement and demarcation of reserved forests has been completed, be possible to offer the assistance of Forest Officers in many districts. Until then, however, this latter question will, I fear, have to stand over.

5. The receipts from District Arboriculture are on the whole as yet small, though they begin to show in a few districts. Ultimately it is quite possible, that the receipts will cover the expenses, especially if planting is done in a systematic manner.

6. From the accompanying reports on *Canal* Arboriculture, it appears that not so much progress in planting has been made, as might have been expected. In most cases this is put down to the want of funds, and in some to the presence of large numbers of monkeys along the canal banks, who prevent young trees being sucessfully established. The former drawback might easily be removed, especially as Canal Arboriculture seems to pay, but it is difficult to say, what should be done to remove the plague of monkeys.

7. The financial results of Canal Arboriculture are the following :—

Name of Divisions.	Receipts.	Expenditure.	Surplus.	Deficit.
	Rs.	Rs.	Rs.	Rs.
Bari Doáb 1st Division	6,983	7,005	...	22
Do. Do. 2nd Do.	7,081	8,308	...	1,227
Upper Sutlej Inundation Canals	1,696	242	1,454	...
Lower Sutlej and Chenab Do.	7,009	1,782	5,227	...
Indus Canals (Dera Gházi Khan)	1,804	5,671	...	3,867
Sirhind Canal Main Line Division	4,000	1,184	2,816	...
Do. Do. 3rd Division	...	1,414	...	1,414
Do. Do. 4th Do.	...	...	...	...
Do. Do. 5th Do.	...	253	...	253
Western Jumna Canal Karnál Division	2,339	1,879	460	...
Do. do. do. Hánsi do.	6,045	1,552	4,493	...
Do. do. do. Dehli do.	4,697	1,325	3,372	...
Do. do. do. New Delhi Branch Division ...	...	423	...	423
Muzaffargarh Canal Division	...	...	...	...
Swat Canal Division	...	...	...	...
TOTAL ...	41,654	31,038	10,616	

It will be observed, that there is an actual cash surplus of Rs. 10,616, and with such results, there should be no difficulty in having the necessary funds allotted; and this the more so, as the canals run through the arid parts of the country, where it is most essential that the production of timber and fuel should be encouraged, besides producing shade, where it is most wanted.

I have the honor to be,

Sir,

Your most obedient servant,

W. SCHLICH,

Conservator of Forests, Punjab.

I.—DISTRICT ARBORICULTURE.

1.—DELHI DISTRICT.

Deputy Commissioner's Report.

The rainfall of the district varies from 23·2 to 36·5 inches.

The road-planting was done partly with transplants about one year old, and partly by sowing seed in trenches along the road. The young trees along the roads were fenced with thorns or mud palisades. Lopping and thinning were executed only in a few cases, where such was considered absolutely necessary. Of the nurseries established, those at Mubarik Bagh, Tatarpur, Tuglakabad and Ballabgarh are reported as successful. The *Bela* plantation at Delhi is managed by the Delhi Municipal Committee, who receive the income and incur all expenditure from their funds. The kíkar sowings carried on in the plantation in June were not successful, having been completely destroyed by the heavy floods of the Jumna. The sowing of tali (sissu) during July, however, turned out well. There are now altogether 5,000 young plants reported to be in existence.

The *expenditure* on account of arboriculture was as follows:—

Establishments	...	Rs. 1,682
Purchase of seed, planting, fencing, &c.	...	„ 780
Total	...	Rs. 2,462

The income realized amounted to—

From the rakh at Tilauri ...	...	Rs. 1,120
„ the Delhi Bela plantation ...	...	„ 1,982
Total	...	Rs. 3,102

The first sum was credited to District funds, and the latter to the Delhi Municipality.

Delhi Municipality.

The Secretary reports as follows:—

"I have been unable to ascertain the number of young trees planted during the last year, but every opportunity has been taken to plant trees and shrubs along the road-sides where it was considered necessary, thereby improving the appearance of several of the roads.

The young trees that have been planted were chiefly procured from the several gardens of the Committee, and consisted of nim, mango, tali, pipal and mulberry.

The ridge road from the Native Cavalry Lines to the Roshanara junction on the ridge near the Flag Staff Tower was planted on both sides with nim trees in the latter part of 1878. These have all proved successful, whereas before many attempts were made similarly, but without success.

During the year under report some two or three hundred mango plants procured from the Saharanpur district were planted on the triangular plot of ground adjoining the Rajpur road just opposite the Mori Gate, and, with the exception of some few, all the plants have survived. This mango grove will, in a few years hence, set off the appearance of this part of the station considerably.

The expenditure incurred in the maintenance of trees aggregated Rs. 3,800 as against Rs. 3,963, thus showing a decrease of Rs. 163 as compared with the previous year. The above amount includes salaries of gardeners and bhistis, the repairing and renewing of plant enclosures, and all other contingent expenses.

There are several descriptions of plant protectors existing, but the Committee are desirous of adopting one uniform pattern, and the subject will be brought forward in the course of a few days before a meeting.

The following kinds are in use at present:—

(*a*).—Iron tree protectors,
(*b*).—Jaffry enclosures,
(*c*).—Mud-wall enclosures,
(*d*).—Brick enclosures.

It is thought best to adopt the last named, because they are ornamental and less expensive. They are constructed in a very simple way, and can always be removed and put up without any extra expense.

Iron tree protectors are also used, but are very expensive.

Kutcha wall enclosures are used along the circular road and in the suburbs, because in such places we require something strong to prevent cattle from destroying the plants.

Jaffry "thaoulas" are of no use whatever, as they easily succumb to the slightest pressure, and the consequence is that they cost a good deal of money in constant repairing and renewing."

The *Commissioner* of Delhi adds the following remarks:—

"The Delhi station is very green and pretty, and some pains appear to have been taken, but it is not understood why the number of young trees planted by the municipality during the year cannot be ascertained. The public gardens are well superintended by the Revd. J. Smith of the Baptist Mission, Mr. Sutherland of the East Indian Railway, and Mr. E. W. Parker, Judicial Assistant Commissioner.

"The Bela plantation, which was made over to the municipality last year, is reported to be working well. 5,000 young trees were planted during the year under report and grew up, but the thick undergrowth and the accumulation of mud and filth after the overflow of the river are much inveighed against, and the Bela generally considered to be a hot bed of miasma.

"The several nurseries appear to have worked at a profit, but the roads throughout the district and in the outlying towns require more attention in the way of tree planting.

"The Tahsíldárs do not take much interest in the matter, and their attention should be called to it. The Deputy Commissioner proposes to have a permanent establishment of road coolies; but this will only increase the expenditure, and not benefit arboricultural operations to any appreciable extent, as far as my experience goes, but it may be tried."

2.—GURGAON DISTRICT.

The rainfall varies from 24·25 to 36·6 inches. Propagation is carried on by transplanting seedlings from nurseries when from 2 to 3 feet high.

Kíkar seed, sown on unpromising soil between Gurgaon and the Delhi boundary, Tooru and Bahaur, Tooru and Nuh, and Nuh and Firozpur, succeeded in a few places only. Farash cuttings again tried near Bhundi did not strike. Thinning and lopping have, as far as possible, been performed under the personal superintendence of the Deputy Commissioner.

A central nursery in the Gurgaon station garden has been very successful, and is capable of supplying young trees to the whole tahsíl. Nim, tali (sissu), Millingtonia and tallow are the principal kinds sown. The last mentioned tree has succeeded well in the station.

Malta orange trees, introduced a few years ago, flourished in the station garden.

The expenditure was as follows:—

Establishments including mates and bhisties	...	Rs.	1,881
Cost of seed, planting, protection, canal water, &c.	...	„	531
Total	...	Rs.	2,412

Mud enclosures cost 3 to 5 annas each, brick palisades Rs. 1-10-0 each. There were receipts amounting to Rs. 196-8-2 by the sale of wood. The rates obtained were very low, owing to the absence of any demand.

The *Commissioner* of Delhi adds that he noticed some splendid avenues between the Railway Station and the Sadr, but that there are sandy tracts in some parts of the district, which make planting difficult. He further says:—

"The Tahsíldárs, with the exception of Rámparshád at Gurgaon, do not take any interest in the matter, and the consequence is that this old district, which has been upwards of 70 years under British Rule, has not been planted out so well as some of the Punjab districts which we have occupied only half that time. The members of the District Committee might be made more useful, and occasion taken to introduce the North country Tahsíldárs, who are more energetic men."

3.—KARNAL DISTRICT.

The rainfall ranges from 11 to 24·2 inches.

No fresh planting was done, efforts being restricted to the maintenance of the work of former years.

There is a good supply of trees of different kind in the nurseries, ready for transplanting.

The expenditure stood thus:—

Gardeners, bhistis, pakhalis, mali mates	...	Rs.	2,624	1	1
Repairs to fences, contingencies	...	„	364	5	6
Subscription to Agri-Horticultural Society	...	„	240	0	0
Total		Rs.	3,228	6	7

The Deputy Commissioner is pleased with the work in Pánipat tahsíl; less so in the other two tahsíls.

4.—HISSAR DISTRICT.

The rainfall at Hissar amounts to 12 inches. The operations were confined to filling up gaps on several roads, and to improving and adding to nurseries and groves.

The species of trees chiefly planted are tali, siris, nim, pipal, bakain, mulberry and tamarisk, all of which suit the soil of the district.

Road avenues have not been successful in the Barwala tahsíl, owing to the scanty and unseasonable rainfall. The same causes operated in Bhiwáni. In these tahsíls all that could be done was to preserve the preceding year's plantation.

At Hissar and Hánsi, where canal water is available, the plants both in groves and road avenues thrive well. In Hánsi, however, some damage has been done by white ants.

In Fatahabad arboriculture is always successful, wherever the influence of the Ghaggan Nala is felt. The rest of the district is as unfavorably situated as Barwála and Bhiwáni.

Nurseries have been maintained at Hissar and Hánsi for the extension of arboriculture in all parts of the district.

The expenditure stands as follows:—

Establishments	...	Rs. 2,532
Other expenses	...	„ 895
	Total	Rs. 3,427

5.—ROHTAK DISTRICT.

The rainfall ranges from 18 to 23 inches. The Deputy Commissioner reports:—

"The total of the trees planted in each tahsíl during the year with the number of trees that died may be seen from the following table:—

Tahsíl.	*Planted.*	*Died.*	*Percentage successful.*
Rohtak	... 422	362	14
Sámpla	... 675	105	84
Gohána	... 1,077	1,001	7
Jhajjar	... 5,606	3,542	37

(No groves or gardens were planted during the year). This gives a total percentage of success amounting only to 36, which is certainly not very encouraging. This want of success may be attributed to the following causes:—

(*a*).—Dryness of district and difficulty in procuring water.

(*b*).—Large amount of kankar in the soil.

(*c*).—Smallness of establishment and want of proper supervision.

The first cause being in the nature of things cannot be avoided, and the only way of providing a sufficient supply of water to the trees, *viz.*, by sinking wells, is impracticable in this district, owing to the depth of the water and the impecuniosity of the District Committee. Several attempts have been made to remedy the second defect, and with great success; but planting and replanting trees in the manner referred to in last year's report, so that their roots should reach below the kankar stratum, is too costly and troublesome to be made an invariable practice. Lastly, a great increase in the number of the establishment cannot be expected in so poor a district; but for the current year it has been proposed to increase the supervising establishment by appointing a jamadár for each tahsíl instead of one for the whole district, and it is expected that by this means the watering and tending of the trees will be better looked after. The trees chiefly planted are: nim, táli, and kíkar.

Fences are generally circular and consist of thorns or a mud wall.

There are four nurseries in the district, which contain 8,200 nim, táli, sirís, and mulberry trees.

In some villages the headmen have planted trees in miniature nurseries, but on the whole not much interest is taken in the matter.

The *expenditure* stands thus:—

Establishments, including bhistís	...	Rs. 3,745
Other expenses ...	...	„ 288
	Total ...	Rs. 4,033

The *receipts* derived from the sale of trees come to Rs. 85."

On the whole, the Deputy Commissioner does not consider the results of the year as very successful, though fairly satisfactory considering the difficulties to be overcome.

6.—SIRSA DISTRICT.

In this district trees are transplanted when they are 2 or 3 years old and 2 or 3 feet high.

During this year the nurseries at Dhanur and Sirsa chiefly supplied trees for tahsíls Sirsa and Dabwáli roads, and zamíndárs were also supplied from them on special application and on the clear understanding that they would take care of the trees given to them.

From the nursery at Fázilka the road-side gaps of that tahsíl were filled with trees; seeds of trees were also sown on road-sides of this tahsíl during the rains.

In the station garden at Sirsa, fruit trees are cultivated. This year 32 lime and 5 pomegranate trees were reared from seed. The nursery in the civil station at Sirsa is partly in this garden and partly in the Station Church and Kutchery compounds.

The expenditure was Rs. 663.

Establishments	Rs.	246
Other expenses	„	417
Total ...	Rs.	663

The income derived from the sale of dead trees, fallen branches and loppings of trees and fruits of trees in the nursery at Dhanur, &c., amounted to Rs. 64.

In this district young trees planted on road-sides are fenced with thorns at no cost, as chaukídárs and coolies employed in looking after them generally keep the fences in order. In winter trees are generally preserved from frost by grass coverings, prepared by the establishment, price of grass and bán munj strings being only charged, which during the year came to Rs. 2-2-11.

7.—UMBALLA DISTRICT.

The rainfall varies from 14·3 to 30·6 inches.

Nurseries have been established along the Umballa and Peho road, with a view of planting it with tali during the year 1880-81.

An experimental garden was started in the Umballa civil lines at the commencement of the official year 1878-79, in which specimens of several kinds of forest trees, obtained from the Saharanpur Gardens, were planted, as well as fruit trees. Of the former *Eucalyptus melanoxylan, Casuarina equisitifolia* and *Grevellea robusta* have thriven best, though the last mentioned species appears to suffer more than ordinarily from white ants. 200 of these trees will be planted about the civil station as an experiment.

Some seed of the mesquet bean was also sown in the garden in 1878; only a few germinated, but these have thriven well, and there are now about a dozen fine plants 8 to 10 feet high, and bearing freely.

The experimental garden consists of 2 acres, but an additional acre has just been purchased, which will be converted into a nursery for young trees:—

Expenditure—

Establishments	Rs.	2,028	0	0
Miscellaneous charges	„	20	1	1
Total ...	Rs.	2,048	1	1

8.—LUDHIANA DISTRICT.

The rainfall of Ludhiána is 14 inches.

There are 4 nurseries for young trees in the district, namely 2 at the Sadr station, 1 at Bussuah, and 1 at Samralla, from which young trees are transplanted to the road sides. These nurseries are well stocked. The young trees by the road-sides are protected by mud walls 4½ feet high, where there is much cattle traffic; in other localities they are fenced in a cheaper way. Tali (sissoo) is the tree most planted, but ber, pipal, nim and jaman are also planted. The branches are lopped off up to 9 or 10 feet from the ground. The expenditure amounted to Rs. 7,999.

9.—SIMLA DISTRICT.

Blank.

10.—JULLUNDUR DISTRICT.

The rainfall varies from 19 to 27 inches.

For roads, as in previous years, a permanent gang of coolies was kept up, who attended to road repairs, as well as to the planting of trees. By this agency 6,382 trees were planted during the year. The results are reported as satisfactory.

The expenditure stands thus :—

For permanent establishment	Rs.	930
(This item includes Rs. 288 on account of Bir Sarangwál, now taken over by the Forest Department).		
Other expenses	„	880
Total ...	Rs.	1,810

Plantations.

There are 26 Government plantations on the banks of the Sutlej, namely 10 in Phillour, 15 in Nakodar, and 1 in Nawashahr.

Last year there were 32 such groves, but one in Phillour and one in Nakodar have been carried away by the action of the river, and another has gone over with other lands to the Ludhiána district. Three blocks of plantation lands in Nawashahr which had no trees on them were restored to the zamíndárs and brought under, and included in, the district rent roll assessment.

Last year's proceeds from thinning and sale of grass in plantations amounted to Rs. 700, which included an item of Rs. 525 received from the Railway authorities on account of sale of wood from the Lisarah, Ramgarh and Nangal groves in Phillour.

Rs. 113 were expended in sowing tali and kíkar seeds in the plantations of the district.

The Empress (late Queen's) Garden, at Jullundur continues to flourish and is maintained in moieties from District and Municipal Funds; last year's income came to Rs. 500, or about Rs. 100 more than in the previous year; the expenditure amounted to Rs. 1,630, which included some unusual items, such as Rs. 158 for price of a garden roller, and Rs. 145 purchase of a pair of bullocks. This garden is managed economically, but it cannot be hoped to make ornamental gardens pay their way. As the fruit trees grow up and yield, the income may come nearer the expenditure.

Nawashahr Baradari Garden is maintained entirely from the District fund: it is an old garden of the Sikh time, and contains many fruit-bearing trees; its income and expenditure amounted to Rs. 300 and 266 respectively.

Narain Garden.—This garden was laid out in the current year from Municipal funds, round the Jullundur Tahsíl Dispensary and Sowár's Lines.

The maintenance expenditure is debitable in moieties to both funds.

11.—HOSHIARPUR DISTRICT.

The rainfall at Hoshiarpur is 23 inches. The Deputy Commissioner reports as follows :—

"Previous to the setting in of the rains, three maunds of bamboo seed (*B. arundinaria*) were procured from the Government plantation at "Pandain;" the seed was distributed over the district and sown at the following encamping-grounds :—1, Talwárá; 2, Hájipur; 3, Mokerián; 4, Dasúya; 5, Tandáli; 6, Garhdiwála; 7, Hariána; 8, Mahbalpur; 9, Majári; 10, Garhshankar; 11, Núrpur; 12, Raepur; 13, Unah; 14, Amb.

"The sowings, which followed the setting in of the rains, have been successful, and it is anticipated that in July and August of the current year there will be some thousands of healthy young plants on the road-side.

"One maund of seed of the Chinese tallow tree, *Enacarria sebifera*, was distributed over the district and sown in July; the result has been satisfactory in each case: this tree apparently will do very well in this part of the Punjab.

"Some experiments were made with *Eucalyptus* seed procured direct from Queensland; the seeds of two species, *Eucalyptus rostrata* and *Eucalyptus goniocalyx*, were sown in February 1879; both germinated freely and appeared to thrive till May and June, when the *Eucalyptus goniocalyx* gave signs of failure, and notwithstanding every precaution, some hundreds of seedlings died; they were allowed ample shade and water, but the fierce heat of May, June and July was too much for them. The *Eucalyptus rostrata* did very well, however, and there is now a fair percentage of young trees.

"A large number of mango, tali and tun trees were planted in the Hoshiárpur and Dasuya purgannahs, but the severe and early winter proved fatal to many hundreds of them. The encamping-grounds of Tánda and Mokerian were partially planted out with mangoes, the number planted out being at Tánda 1,000, and Mokerian 1,800, but a large number, some 30 per cent., succumbed to the severity of the winter.

"Good progress was made on the new Mahalpur and Kot Futlu road, more than half the road being completed. Great assistance was rendered on this road by Nagina Singh, Zaildár of Mahalpur.

"Experiments were made in planting out and protecting the roadways across some of the chós. The experiment consisted in marking out strips of land about 5′ broad and about 30′—40′ apart running parallel to each other across the chós; these strips were planted out with khar (*Saccharum sara*"), Nana (*Malva parviflora*) and Banna (*Vitex negunda*) which took well, and after the first month required little or no care.

" Mr. Faddy, the District Engineer, thus describes a system of transplanting saplings on to the road-side, which he introduced with the Deputy Commissioner's sanction. 'On either side of the road two small trenches were dug, about 18' apart, 1' × 1'; into these trenches, as close as could be placed, young tun, tali, mango, *Eucalyptus* and pipal, &c., were "dibbed;" the young trees were almost touching each other, giving two belts or lines of healthy young saplings. As they grow up the weediest and most scraggy will, from time to time, be eliminated, until in course of time there will be found a good shady avenue of well-developed healthy trees which during their growth will have afforded shade and protection to each other from wind, rain, heat and frost. It is quite true that trees will not be at fixed intervals or in lines arranged with mathematical precision; but in growing them in the manner laid down above, we take a leaf out of the great book of Nature, whom we cannot copy too closely.' I give these remarks as I have not myself seen the localities and cannot say therefore to what extent these experimental plantings are copies of Nature, which does not usually lay out avenues.

" The former injurious method of pruning and lopping has been discontinued.

" The establishment consists of 3 jamadars and 86 malíes. There is no jamadar in the Unáh purgannah. The best progress was made in Hoshiárpur and Dasuya; the work in Garshankar was not quite satisfactory. Total number of trees planted out was 37,158.

" Proceeds from clearings and fallen timber, Rs. 2,067."

The Commissioner adds the following remarks :—

" This system (Mr. Faddy's) is not bad, provided that the thinning out is systematically and judiciously done. The fear is that it may be neglected and that the young trees from over-crowding may be spoiled by not having room for lateral growth."

And he further adds, as regards the discontinuance of the former injurious method of pruning and lopping :—

" This was in consequence of a Circular issued by me last year. The instructions of the Circular had not, however, been at all intelligently carried out, as I observed in marching through the district in the cold weather. A great deal of thinning out is required in the avenues of this district. The trees are over-crowded and for want of lateral space have grown up long and thin."

12.—KÁNGRA DISTRICT.

The rainfall varies from 46·9 to 89 inches.

There are, it appears, 7 nurseries in the district, covering close on 3 acres.

The Deputy Commissioner states that, all that could be effected with the limited resources at his disposal, was done. Of the 25,190 trees planted on road sides, 4,615 died on account of the dryness of the season.

He states further that endeavours are being made to start the cultivation of bamboos.

The expenditure of the year was Rs. 797, of which Rs. 180 were spent on establishment.

The Commissioner considers that more might have been done in a district with so favourable a climate as that of Kangra.

13.—AMRITSAR DISTRICT.

The rainfall varies from 22·6 to 25·5 inches

The following new works were undertaken during the year and completed :—

(1) Gehree to Jandiála road —2½ miles throughout
(2) Wazír Bhullar Batála —1½ miles partly
(3) Tarn Táran Ghuranda 1 „ „
(4) Chogoan Atárí ... 5 „ „

These roads have been planted with tali and various other kinds of trees with fair success, and few of the trees planted out have died.

The Gehree road is a Railway feeder and much frequented by travellers and wheeled traffic. Another useful work has been completed in planting the compound of the new Court house with different shrubs, also in thinning and felling the civil line road-side trees and filling up vacancies.

The blanks of district roads have been successfully filled up. Notwithstanding it was done in many different parts of the district and scattered miles of the road, shown in the statement.

There are only 2 regular plantations in the district well stocked with various sorts of trees. The Sadr plantation contains about 18,885 trees raised from seeds and cuttings, of which 12,995 are fit for transplanting, as they are 2 and 3 years old.

The Chogoan plantation contains 4,900 seedlings; most of them are kíkar, as the land in the neighbourhood is full of kankar and hardly suited for good timber trees.

The Sadar plantation is an old one, the Chogoan plantation has only been started during the last year.

2,380 trees have been given away during the year in addition to those planted on the roads.

The usual annual and six monthly lopping and pruning of trees has given good results, as it was carried out skilfully and proved lucrative.

The total amount realized by sale of branches and dry trees amounts to Rs. 954 against Rs. 746 realized during the last year.

The cost of arboriculture has been considerably increased, by the imposition of a canal water-rate of ½ an anna yearly on each tree watered by the canal. This rate is very heavy.

The expenditure amounted to Rs. 6,930,

14.—GURDASPUR DISTRICT.

The rain-fall at Gurdáspur amounts to 30·1 inches.

The trees planted on road sides were from 2 to 3 years old, the average height of bakáin when planted was 4½ feet, tali 3½ feet, and jáman 2 feet.

Each tree is fenced with thorns, or in the station with euphorbia; these materials cost nothing, but the labour spent in making and replenishing is not inconsiderable. The early frost in November proved most destructive to mangoes as it came before the trees had been covered up for the winter.

Some trees were also destroyed by fires among the long road-side grass. It is proposed to make each village responsible for keeping the grass short along the piece of road in its boundaries, and in return it will be allowed to take gratis, the grass which is usually saleable.

Nurseries are maintained in 2 gardens at the Sadar, and at each outlying tahsíl, mango, jaman tali, mulberry (Country, China, and Philippine) were reared from seed or cuttings, and some mangoes were grafted. Nurseries of China mulberry cuttings were also formed at 5 Nazul gardens in different parts of the District.

Fruit trees were obtained for the gardens from the Agri-Horticultural Society at Lahore.

The expenditure amounted to:—

		Rs.	A.	P.
Establishments	...	4,043	14	9
Other expenses	...	1,308	13	7
Total	...	5,352	12	4

The receipts were:—

		Rs.	A.	P.
Income from gardens	...	377	6	1
„ from sale of dead trees, loppings, grass, &c.	...	570	2	9
Total	...	947	8	10

15.—SIALKOT DISTRICT.

The rainfall at Siálkot amounts to 27 inches.

No new work was undertaken.

The work of the previous year was gone over, and gaps filled up chiefly with tali and siris, which are said to succeed best in the district.

A tree of Eucalyptus saligna, planted 5 years ago in the District Fund garden, has made wonderful growth, A carob tree in the same garden is also thriving.

Three out of the European olives have again fruited, but the fruit, after attaining the size of a large pea, invariably drops off.

The expenditure amounted to.—

		Rs.	A.	P.
Establishments	...	2,457	14	6
Miscellaneous expenses	...	284	14	9
Total	...	2,742	13	3

The income derived chiefly from the sale of old trees and thinnings come to Rs. 1,098.

16.—LAHORE DISTRICT.

No narrative given.

17.—FEROZEPORE DISTRICT.

The rain-fall of Ferozepore is 10 inches.

It has been found practically useless to extend road-side avenues in the high-lying parts of the district in tahsíls Mogah and Muktsar, but the advent of a branch of the Sirhind Canal would improve matters; attention has been confined to the river and lower lands which can be reached by cuts from the innundation canals or where there is well cultivation. The Ferozepore and Mumdot, Ferozepore and Fázilka, Maklin and Zira roads are in such localities, and on these the young plants are doing well.

The expenditure has not been given.

The Commissioner adds:—

"In regard to the Ferozepore report, I have only to say that I consider the Deputy Commissioner's action in confining his operations to those parts of the District, where water was readily available, well-judged."

18.—GUJRANWALA DISTRICT.

The rain-fall varies from 16 to 23 inches.

Trees are regularly watered by hand labor, and are carefully looked after by the establishment kept up for the purpose.—

"The planting operations of the year were restricted to a few roads and no new road was taken in hand during the year, except a portion of the road from Gujránwála to Kheali, on which 1,000 trees were planted; all of them are reported to be in good condition. In Hafizábád no attempt will be made to plant new trees, as the soil is not suited for the growth of trees. Attention was chiefly paid to the tending and preservation of old trees; gaps and blanks being filled where neccessary.

No new nurseries were planted during the year, but the young plants in the old nurseries are thriving.

The method of planting is the same as described in last year's report, *viz.*, transplanting young trees from nurseries; fencing them with mud-walls, which cost about 4 annas each, and watering them three times a week. The trees planted are generally tali, siris and kikar. The season for planting is February and March, also the rains.

Lopping is always executed with saws and is never done except when absolutely necessary. In cutting off the branches, due regard is paid to the instructions issued on the subject.

The expenditure amounted to Rs. 3,728.

The income derived from the sale of loppings during the year, came to Rs. 547.

The Commissioner of Lahore adds:—

"I have no remarks to offer on these reports except that in regard to the Gujránwála district I hope the Deputy Commissioner in his remarks about nurseries does not mean that no seedlings were sown or slips planted in nurseries during the year. Nurseries should always be kept filled, so that a supply of plants two or three years' old may be always available and ready for planting. It seems to me also that if the Deputy Commissioner plants in *March* he plants too late, January and February are better than February and March. In March the heat is too great."

19.—RAWALPINDI DISTRICT.

The rain-fall of Rawalpindi is 34 inches.

The Deputy Commissioner states that, owing to the scarcity of rain during the year, only very few trees were planted. No other information has been given.

20.—JHELUM DISTRICT.

The rain-fall of Jhelum is 29 inches.

A comparatively large number of trees died during the year, which the Deputy Commissioner ascribes to the scanty rain-fall.

The following nurseries are maintained:—

At Pira-Ghaib, near Jhelum	...	...	1
" Pind Dadan Khan	...	...	2
" Kalar Kahar ...	...	...	1
" Chackwál ...	...	...	1
" Talagang ...	...	...	1
" Choa Saidan Shah	...	...	1
	Total	...	7

Chiefly large plants, some 6 feet high, are planted out, as they are supposed to thrive very well after a season's watering. The trees for transplanting on road-sides are dug up with as much earth as possible at their roots, and planted in holes at least 3 feet in diameter and 3 feet deep; they are also protected by fences made of pilchie or sanatha.

The expenditure amounted to Rs. 7,279-10-0.

21.—GUJRAT DISTRICT.

The rain-fall of Gujrat is 32 inches.

Tálí trees were transplanted from the Gujrat Church garden nursery to the several roads. These trees were all 2 years old. In the same nursery fruit trees of different kinds are also under cultivation.

Planting operations were not extended owing to the want of seasonable rain.

The young trees planted out have all been carefully fenced with thorns.

The expenditure amounted to Rs. 570.

22.—SHAHPUR DISTRICT.

The rain-fall varies from 5·4 to 11·2 inches.

New trees were planted on road-sides where the old ones had died, also a little new work was taken in hand; but from the statement annexed, it is shown that planting and sowing on road-sides were generally a failure. The season was such a very dry and rainless one, that young trees planted in arid tracts failed, even when they were kept well watered. Those that succeeded were planted in more favorable spots, such as station roads and plots where vegetation is more abundant, and where the establishment kept up is better supervised. On outlying roads where no avenues of trees existed before, and along the banks of the canal cuts, new work is chiefly confined to sowing kikar seed in the rains. Ordinarily, if the rain-fall is favorable, a fair result follows, and very little future attention is necessary. But the past year was too dry for such operations to succeed.

The trees planted during the year were chiefly kikar and a little táli and mulberry.

Kikar is the only tree that grows well in the district, at least in the plains portion of it. Mulberry grows well in the Salt Range.

Kikar seed is sown in the months of July and August, and the young trees transplanted when a year old, if transplants are required.

The soil seems to be peculiarly suited to kikar, and however difficult it may be to transplant this tree in other districts, there is no such difficulty in Shahpur; and the fine avenues of kikar trees along the Bhera and Shahpur road and in the Civil station have been raised in this way.

There has been no further experiment with Carob trees, but those growing in the Civil station and the Sodhi gardens are still flourishing and fruitful.

The expenditure comes to—

Establishments	Rs.	1,730
Contingencies	„	989
Total	„	2,719

The receipts amounted to Rs. 104, derived from the sale of decayed and fallen trees and branches.

23.—MOOLTAN DISTRICT.

The Deputy Commissioner reports thus :—

The average rain-fall in the district during the year was 3·1″. The district is well known for its arid soil and for the extensive tracts of land without any cultivation of any kind owing to the want of water. The difficulty of growing trees is great in places within reach of water, but planting almost impossible where there are no tanks or wells or hollows containing water, and there are many lengths of road for miles totally destitute of water, where it is hopeless to raise trees, unless wells are gradually sunk at regular distances along these roads.

The work of the year consisted in planting trees along the road-sides, where vacancies had occurred. These operations took place over an aggregate length of 106 miles out of a total of 438 miles. During the year along these 106 miles, 3,640 trees were planted out, of which 844 were complete failures. Most of the planting took place in the Mailsi tahsíl, where 2,757 trees were planted.

It has not been practicable to go on planting progressively mile after mile of road in a certain direction, certain lengths of road having been taken in hand, which owing to their proximity to wells afforded reasonable hopes of success.

The old *nurseries* at Lodhrán, Jalálpur and Sirai Sidhu were re-stocked with 1,800 young plants, all of which were more or less successful.

New nurseries were established at Mailsi Tibbá, Kehror and Pakhi Mián, in which about 7,800 plants consisting of ber, pípal and tálí cuttings were raised with tolerable success.

It has been found by experience that seedlings of ber and pípal are very difficult to rear. Cuttings generally succeed. It has been the custom here to rear tálí trees from cuttings.

Kikar trees are not transplanted, they are raised from seeds wherever desired.

Round mud walls for the protection of the trees are made in this district at an average cost of 3 annas each.

The *establishment* consisted of two jamadárs at 8 rupees each and 16 málís at different rates. Total Rs. 1,050 annually. There were 27 bullocks maintained for the 7 wells kept in working order for the watering of trees under direct management at a cost of Rs. 278. The cost of planting and watering trees amounted to Rs. 503 for the year, for the tahsíls of Mooltan and Serai Sidhu; in the other 3 tahsíls of the district, the work was undertaken by the Zamindárs who were promised Rs. 12-8 per cent. per annum for all new trees planted and found to be thriving after two years.

The District Committee give a donation of Rs. 240 a year to the Agri-Horticultural Society, Lahore, for seeds supplied in return, so the total expenditure was Rs. 2,071.

24.—JHANG DISTRICT.

The rain-fall varies from 4·2 to 6·6.″

During the year 1,284 blanks were filled up, and 4,047 young trees were reared in nurseries.

The expenditure amounted to—

Establishments	Rs.	2,445
Other expenses	„	509
Total	„	2,954

The receipts came to Rs. 12.

25.—MONTGOMERY DISTRICT.

The rain-fall of Montgomery is 5 inches.

The trees specially adapted to the climate are said to be jhand, karíl, pílú, farásh, kikar and ber.

The sharin, tálí, lodár, tállow, pipal, túm and mulberry lately planted look promising, and will, the Deputy Commissioner thinks, succeed, if properly looked after and regularly watered.

The trees planted are protected by thorny branches placed around them, and in the cold season they are protected from frost by grass coverings.

The expenditure was as follows:—

Establishments	Rs.	364
Other expenses	„	1,464
Total	„	1,828

26.—MUZAFFARGARH DISTRICT.

The rain-fall ranges from 1·5 to 3·1″.

The Deputy Commissioner reports as follows:—

The road leading from Muzaffargarh to Dháka *via* Alípur has fine avenues for about 13 miles onward from the station. Beyond that, the road is bare. There are plantations near the sites of towns and villages lying along the road. But it seems improbable that any further improvement to the road, in the shape of plantations, can be made owing to the low and sandy nature of the soil coupled with the disadvantage of the road being flooded during the flood season.

The road leading from Muzaffargarh to Maysudpur *via* Rangpur, has fine avenues for about 5 miles. The rest of the road is just as bad as the one mentioned above.

The only improvements which were feasible under the circumstances, were made at select pieces of the roads as per subjoined details—

(I) A grove was planted and a large nursery was formed in the 2nd mile of the first road;

(II) trees were planted in the 9th mile of the second road;

(III) gaps were filled and new trees were planted for dead ones on both roads.

On the Mahmúd Kot and Ahsanpur road 1,109 trees were planted, but only 425 survived.

The trees planted last year on the Muzaffargarh and Kuraishi road all died. This year new trees have been planted out and a small grove also formed.

In the station, on the Jail road a few blanks were filled, new trees planted for those which had died, and a small grove plantation established on the road running by the church. Trees were also planted in the encamping grounds at Muzaffargarh, Kuraishi, Jatoi, Khairpur, Sanadan, Mirwali and Kot Adu. In the station, trees were planted around the church, session house, police hospital, and cemetery, where tree seeds have also been sown. The following fruit trees were planted in the Talerí garden;—

50 Fig trees 80 Grapes 25 Aloochas—Budded 25 Do. large, from cuttings 75 Peaches, flat budded. 25 Nok-Peaches. Nok, large round 25 Do. round English	Purchased from the Agri-Horticultural Society.

A few trees were also planted in the ground attached to the police rest-house at Khangarh and in the garden situated on the Kinjhar and Kuraishi road. Altogether 4,032 trees were planted, of which 953 died, and the rest are reported to be thriving. The following species were planted:—

Tálí	...	...	3,413
Siris	...	...	69
Pípal	...	...	22
Ber	...	...	41
Singhna	...	...	2
Lashora	...	...	5
Jaman	...	...	74
Mangoes	...	...	17
Mulberry	...	...	74
Fig	...	...	80
Grapes	...	...	50
Aloochas and Peaches	...	...	175

Almost all the trees that failed were tálí.

The Talerí garden is the largest nursery in the district. In the outlying tahsíls trees were purchased from zamindars. During the year under report two large and promising nurseries have been formed at a short distance from the station to admit of constant supervision.

The work of transplantation is done in the district during the months of February and March. At that time young plants ranging from 3 to 5 feet in height are planted on road-sides and in other places. To prevent risks from cattle, thorny branches of shrubs and branches of the date tree are firmly planted in the ground around them. No lopping was allowed.

The total outlay on arboricultural operations during the year aggregated Rs. 4,009-8-2 against Rs. 3,921-5-4 in the preceding year, including Rs. 2,270-5-4 on trees planted on road-sides, and Rs. 1,739-2-10 on arboriculture proper, incorporating the cost of maintenance of the station garden.

For the trees planted on road-sides a regular establishment of 18 bhistís was entertained throughout the year, and a few bhistís more added temporarily. For the arboricultural work, the station garden excepted, 10 bhistís were kept up. About 18 Government wells, some attached to buildings and encamping grounds and some situated on road-sides, were kept working with 14 pairs of bullocks. In some places private wells were also availed of. The irrigation consists mainly of well water, slightly supplemented by canal water during the inundation season. To the station garden a complement of 13 gardeners is attached, who have 5 pairs of bullocks and 2 wells in the garden to work with. During summer, the garden is also irrigated partly by the Ganeshwah and Talerewah canals which pass by it.

The following income was derived from the station garden and roadside trees:—

Sale of road-side trees	...	...	Rs.	295	6 8
Do. of fruits in garden,	...	...	„	494	0 0
Do. of vegetables do.	...	...	„	90	12 7
		Totol	...	790	3 3

27.—DERA ISMAIL KHAN DISTRICT.

The rain-fall varies from 8·5 to 10 inches.

The Deputy Commissioner reports as follows:—

This District may be divided into three distinct tracts of country, in each of which a separate plan of operation in tree planting must be followed. The three tracts are—

(I) The "Thall" or sandy desert stretching from the Katchi of the Indus to that of the Chenab.

(II) The "Katchi" or low alluvial lands of the Indus running through the centre of the district from North to South.

(III) The "Daman" or high land between the right bank of the Indus to the foot of the hills on the West. This tract is sometimes for a period of 10 months blessed with no rain, when drinking water is a scarcity and the people have to leave their villages with their cattle and move to the banks of the river; such a season of drought has just been experienced throughout this tract. At other times, however, especially in July and August, this portion of the district is sometimes so flooded with water from the numerous hill torrents, which intersect it from West to East, as to be quite impassable for several days at a time.

The natural dampness of the soil and the proximity of water to the surface render the centre or riverain tract the most favorable, of the three described, for tree growing, and there are few parts of the "Katchi" where good shade of either the tálí, the ber or the tamarisk cannot easily be met with. On the road between Bhakkar and Leiah there are stretches of avenues of old khagal, or tamarisk trees, frequently to be met with, which must have been planted in the early days of our rule when Leiah was the Head Quarters of the district. Efforts have been made to renew these old avenues where trees are falling from age, and to extend them in some places by fresh planting, but chief attention has been directed of late years to the treeless tracts of the Thall and Daman.

Perhaps no more hopeless task ever presented itself, than growing trees on such barren and waterless tracts as these, especially when it is considered how their natural difficulties, as regards soil, climate, absence of water and irrigation, are increased by the absolute want of real interest shown by all officials in the subject, and the apathy and indifference displayed by the people in the matter.

On the Thall the only plan that can be followed in growing trees, is first to sink wells and thus secure the means of watering the trees for the first year of their existence. This has now been done along the main road across the Thall from Dera *vid* Bhakkar to the Rail at Chíchawatni. More than 60 wells are now completed and held by people, who agree to maintain trees in the vicinity of their wells along the road on condition of holding their wells free of revenue. Nearly all these wells have now trees growing up about them on one or both sides of the road, and in this way shade is constantly met with by travellers across this sandy desert. Progress in a project of this kind must be slow, but, I think, sufficient success has been attained to justify further exertions in the same directions. Sometimes, however, prospects here appear very dark, when a season of drought, such as the one experienced, for the last 10 months, visits the district. In such times half the inhabitants desert the Thall, and tree planting and everything else connected with it appear to decline rapidly. Much labor is lost, and much work has to be done over again. It is only by comparing the treeless state of the road a few years back, that one can see that still some decided progress has been made. Fortunately such seasons do not very frequently occur, otherwise it would be hopeless to attempt tree planting across such a desert. The tamarisk, ber and kikar are the trees that grow best on this tract.

The Daman country also offers few facilities for tree planting. The rain-fall is very scanty, wells are almost unknown, owing to the distance of the water from the surface and its brackish character when reached, consequently the rearing of trees becomes a very difficult matter indeed. Operations have been confined to the two main roads leading from Dera to Bannu and from Dera to Tánk. They both run chiefly through the Daman. The same plan has therefore been followed in growing trees on both. Small "katcha" tanks with a depth of 4 to 6 feet have been dug at intervals of a mile or so along the roads, and seeds and cuttings of hardy trees, as the tamarisk, ber and kikar, are sown and planted round their edge. The tanks collect the rain water of the ground for some distance round, and for a long time keep the soil in which the trees are growing moist, and enable them to be watered easily and afford travellers drinking water until they dry up. In this way several groves of trees have grown up along both the roads above named. The method is simple and inexpensive and more successful than any other I know for growing trees along roads on the Daman. Owing to an arrangement that has recently been made to bring down a permanent flow of water from the Gunmiah mouth to Dera, these tanks, whenever dry, can be refilled and in this way a speedier and surer success may be expected to attend tree planting operations on these roads, than could have been hoped for, had the tanks, as hitherto, still depended solely on rain water for their supply.

The expenditure amounted to **Rs. 1,038.**

28.—DERA GHAZÍ KHAN DISTRICT.

The rain-fall of Dera Gházi Khan is 4 inches.

The Deputy Commissioner says :—

As reported last year, the injury caused by the flood of 1878-79 has retarded planting operations on road-sides to such an extent, that even yet no work beyond the renewing of trees destroyed can be undertaken. The deterioration of soil from the flood is the greatest difficulty that has to be contended with. Although last year all the trees destroyed were renewed, the greater number died and the gaps had again to be filled up. This failure is solely attributable to deterioration of soil. The plants are now doing well and it is hoped they will get through the winter successfully to enable the extension of road-side planting to be taken in hand in the months of February and March next.

About 2 miles of road from Rájanpur to Hájipur was all the new work taken in hand during the year under report; the plants are doing well.

Altogether about 9,000 trees have been planted during the year, 4,000 on road-sides and 5,000 in plantations and nurseries; the greater number of these were tálí. Kikar is so very susceptible to injury from frost, that its cultivation along road-sides has been given up, but its cultivation at the Kotlá Sikhání plantation will again be tried, *as in clumps it has been found to withstand frost fairly.*

The nurseries along road-sides, that had been destroyed by the flood, have now been re-stocked (from both last year's and this year's sowings), from which an unlimited supply of plants will be available for planting out on road-sides during the spring.

The expenditure during the year amounted to Rs. 4,033-8-3, against Rs. 4,423-0-0 of the previous year. There were 32 bhistís employed for watering road-side trees and 6 pair of bullocks were kept up for the irrigation of the Kotlá-Sikhání plantation.

29.—BANNU DISTRICT.

The rain-fall varies from 6·6 to 8·4″.

Mulberry and tálí are the species chiefly planted. There are nurseries in the public garden at Bannu, and at Naurang Sanai well.

The planting is done in February, March and August.

The expenditure amounted to —

Establishments	Rs.	1,042
Other expenses	„	37
Total	„	1,079

30.—PESHAWAR DISTRICT.

The rain-fall varies from 2·6 to 16·7″.

There have, the Deputy Commissioner states, been no regular rains since 1877, hence arboriculture is dependent on canal irrigation, and this is in many cases not sufficient. Considering these circumstances the planted trees are doing fairly well.

Tálí, kikar and willow are preferred for planting. *Grevellea robusta*, planted last year, is doing particularly well. The trees are protected by mud enclosures.

The expenditure amounted to —

Establishments	Rs.	6,311
Other expenses	„	166
Total	„	6,477

Regarding the Pesháwar *Jhil* plantation, the Deputy Commissioner reports as follows :—

I am unable to report any favorable progress in the actual work of plantation. The draining of it is the first work, and this, after it had been carried out to a small extent by us, was made over to the Executive Engineer, under orders. Up to this, in spite of frequent calls, the Executive Engineer has done nothing, has not even sent a subordinate to look at the work.

During the current year, arrangements have been made for making the ground pay. Grass, &c. has been leased out for Rs. 1,900 for the year; thus leaving the place no burden to the Government. Its establishment has been reduced to a minimum by the Conservator of Forests, but the Department,

Public Works is doing nothing towards attaining the object of the Government, which is to drain without loss of time a malarious bit of country situated close to one of the largest cantonments in India.

Expenditure—

				Rs.	A.	P.	
1 Jemadar	...	...	at Rs. 10 per mensem,	117	0	0	less fines
1 Mali, 5 months	...	...	at „ 8 „	40	0	0	
9 Do., 4 do.	...	...	at „ 5 „	180	0	0	
8 Do., 4 do.	...	...	at „ 5 „	160	0	0	
1 Do., 5 do.	...	...	at „ 6 „	30	0	0	
Excavating drain	...	...	... ...	229	0	0	
Baskets	...	...	... ...	4	5	0	
			Total Rs.	760	5	0	

Rs. 909 5 0 was realized on account sale proceeds of grass. This was much under the income of the previous year.

31.—HAZARA DISTRICT.

The rain-fall of Abbott-abad is 35 inches.

The Deputy Commissioner reports as follows:—

About 7,800 trees were planted during the year, of the following species:—

Eucalyptus, chír, willow, mulberry, wálnut, horse chesnut, dráwá, bayár, tún, deodár.

The planting was conducted by the District Committee's establishment, and by the Municipal Committee. The trees planted by the two Committees within their respective limits are detailed in the accompanying statement under roads, groves and plantations and gardens.

Of the 16 miles of road-side planting shown, 9 miles are under the control of the District Committee, 4 under the Municipal Committee, and 3 miles of station road under direct management of District Officers, and the cost thereof is defrayed from the local provincial fund. The cost of the others were borne by the District and Municipal Committees, respectively.

These plantings were all on old grounds where the trees planted in former years had withered or were stunted; a few gaps here and there, which had not been planted before, were filled up. No new plantations were undertaken during the year.

In the grass preserve at Abbott-abad, fir plants were largely introduced this year on grounds suited for the purpose. *Eucalyptus* seed was also sown in beds, but did not germinate.

The *Eucalyptus* grows well in the district, and large numbers of well-grown trees may be seen in many places, particularly in Abbott-abad.

The Manakrái Rakh is an extensive plot of land rather rocky, but grass and fuel wood grow largely on it. Other valuable species of trees as the tún and tálí are being planted on it now.

The other plantings in civil stations, municipality limits, tahsíl compounds, &c. were mostly renewals of withered and useless trees, as these places have already excellent trees of former year's growth, and do not require much new planting. In fact, the district is well off for trees and there is not much waste land, Government property or private, without trees. There is room, however, for improvement and that is the substitution of better species of trees, such as the plane, tún, walnut, *Eucalyptus*, &c. instead of the bakáin and mulberry so commonly met with on road-sides.

The station and municipality gardens call for no special remarks. These gardens are not ornamental, but are well stocked with fruit trees and are productive.

Nurseries for forest and fruit trees exist, and zamindars and others are supplied on application with trees from them.

32.—KOHAT DISTRICT.

Blank.

II.—CANAL ARBORICULTURE.

1.—BARI DOAB, 1ST DIVISION.

I. Avenue.

		Miles.
Total length	Main Line and Main Branch upper...	167
	Kasúr Branch	145
	Sabraon do.	124
		436
	Avenue complete	161
	Avenue incomplete	275

Work of the year.—Planting 4,690 trees on the incomplete portion, over 44 miles, and planting 46 miles new.

Most of the trees succeeded.

II. Spoil Banks.

Area sown already, 655 acres; area added during year, 3 acres; still remaining to be done 1,274 acres.

The 3 acres were in two different places, and were sown with tálí seed.

III. Chauki Compounds.

A few tálí and fruit trees were added during the year.

IV. Management.

A good deal of wood was apparently sold during the year, though the quantity is not stated.

V. Financial Results.

RECEIPTS—

		Rs.
	Sale of wood	5,379
	Grass and fruits	1,604
	Total	6,983

EXPENDITURE—

	Establishment	5,844
	Working	542
	Sowing Spoil Banks	129
	Maintenance of compound ...	490
	Total	7,005

2.—BARI DOAB, 2ND DIVISION.

I. Avenue.

		Miles.
Total length	Lahore Branch	125
	Lower Main Branch	186
	Kirn escape	23
		334
	Avenue complete	282
	Avenue incomplete	52

Works of the year.—Existing trees maintained, watered and pruned.

II. Spoil Banks.

Area sown already, 1,600 acers; added during the year, 15 acres; still remaining to be done 885 acres.

15 acres were sown with tálí and mulberry.

In the unplanted portion, the soil is very bad.

III. Chauki Compound.

The work of the year comprised the maintenance of existing plantations, and an endeavour to introduce trees of a more valuable kind.

IV. Management.

Thinning has been carefully carried out, a large quantity of wood being sold at Rs. 15 to 25 per hundred maunds. Several kinds of *Eucalyptus* seed have been distributed in various parts of the division.

V. Financial Results.

RECEIPTS—

	Rs.
Sale of wood	4,384
Grass and fruits	2,697
Total	7,081

EXPENDITURE—

	Rs.
Establishment	4,280
Working	2,308
Sowing Spoil Banks	1,335
Maintenance of compounds ...	385
Total	8,308

3.—UPPER SUTLEJ INUNDATION CANALS.

I. Avenue.

		Miles.
Total length	Katora Main Canal	66
	Attari Rajbuha	23
	Pakoki Rajbuha	10
	Chunean Rajbuha	17
	Khannah Main Canal	81
	North Rajbuha	18
	South Rajbuha	12
	Bahawaldas Rajbuha	5
	Upper Sohag Main Canal	57
	Bunja Saliwal Rajbuha	5
	Baparwat Rajbuha	7
		301

No new work was carried out during the year. The trees appear to spring up spontaneously.

II. Spoil Banks.

The area of spoil banks is about 1,500 acres, and the trees are self-sown,

III. Chauki Compounds.

No new work carried out; the old plantations were kept up.

IV. Financial Results.

RECEIPTS—

	Rs.
Sale of wood	225
Grass, &c.	1,471
Total	1,696

EXPENDITURE—

	Rs.
Maintenance, &c.	242

4.—LOWER SUTLEJ AND CHENAB INUNDATION CANALS.

I. Avenue.

				Miles.
Total length	Canal Branch	...	...	10
	Chanab Bund	...	...	32
				42
	Avenue complete	...	...	42

During the year existing gaps were filled up.

II. Spoil Banks.

The area of spoil banks is not stated, but the entire length of the canal is 1,362 miles, or 681 miles on either side. The existing trees are self-sown.

III. Chauki Compounds.

No new work during the year ; old trees maintained.

IV .Financial Results.

RECEIPTS—

			Rs.
Sale of wood ...	...	...	3,613
Grass and fruit	...	...	3,396
		Total	7,009

EXPENDITURS—

			Rs.
Establishment	...	...	1,074
Maintenance of compound		...	708
		Total	1,782

5.—INDUS CANALS, (DERA GHAZI KHAN).

I—Avenue.

	Miles,
Total length—Canal	1,337
Avenue complete	160½
Avenue incomplete	1,176½

The new work during the year under review was the planting of 5 miles chiefly with táli, also some kikar and siris, one mile of which was washed away by the action of the river.

There are 1,11,615 self-sown trees along the banks of the various canals. The largest number of these are *Tãmarix articulata*, tálí, *Salvadora indica*, date palm, kikar, jand and bêr. Ten miles of canal banks and bunds were planted with trees; of these about half failed owing to drought. 5,001 trees were planted out in filling up gaps. These were generally successful.

II.—Spoil Banks.

No area is given, but self-sown trees are numerous. 4,000 trees were planted at Sharíp Shah

III.—Chauki Compounds.

Nurseries are kept up at different chaukies to supply trees. During the year 25,000 young trees were reared.

IV.—Financial Results.

RECEIPTS—

			Rs,
Sale of wood ...		...	1,738
Grass	...	...	66
	Total	...	1,804

EXPENDITURE—

	Rs.
Establishment	4,452
Avenues	250
Spoil Banks	300
Maintenance	669
Total ...	5,671

6.—SIRHIND CANAL, MAIN LINE DIVISION.

I.—Avenues.

		Miles.
Total length—Canal ...	... ...	78
Avenue planted ...	...	69
Do. not planted	...	9

The work of the year was confined to filling up gaps.

II.—Spoil Banks.

Area already sown 875 acres, area added during the year, 169 acres; remaining to be done 194 acres. The chief trees sown are mulberry, jáman, mangoe, túm, kikar, teak and gum trees.

III.—Chauki Compound.

The work during the year was confined to maintenance.

IV.—Financial Results.

	Rs.
RECEIPTS—	
Sale of wood	4,000
EXPENDITURE—	1,184

7.—SIRHIND CANAL, 3RD DIVISION.

I.—Avenues.

			Miles.
Total length	Combined Branches ..	...	4
	Abohur Branch ...	...	98
	Battinda Branch ...	...	26
	Total	...	128
Avenue complete	...	...	40
Avenue incomplete	...	...	88

The chief work of the year appears to have been filling up of gaps and the maintenance of old trees. Táli and mulberry are the most successful species.

II.—Spoil Banks.

Area already sown, 844 acres; area added during year, 512 acres; area remaining to be sown 631 acres; total 1,987 acres. Of the new sowings about 320 acres were successful.

III.—Chauki Compounds.

During the year trees were planted on miles 43 and 51, Abohur Branch, and in chaukis at miles 12, 22 and 32, Bhattinda Branch.

IV.—Financial Result.

			Nil
RECEIPTS—			
EXPENDITURE—			Rs.
	Establishment ...	...	133
	Avenues planting ...	...	468
	Spoil Bank ...	...	513
	Maintenance ...	...	300
	Total	...	1,414

8.—SIRHIND CANAL, 4TH DIVISION.

Nothing was done during the year for want of funds.

9.—SIRHIND CANAL, 5TH DIVISION.

I.—Avenues.

			Miles.
Total length	1st Feeder	... ...	32
	2nd do.	... ...	31
	3rd do.	... ...	17
	Kotla Branch	... ...	58
	Guggur do.	... ...	108
	Choa do.	... ...	50
	Patiála Navigation Channel	...	12
	Total	...	308

			Miles.
Avenue complete	...	...	40
Avenue incomplete	...	...	268

The work of the year was confined to the maintenance of trees and the filling up of gaps with 1,834 trees on the 3rd Feeder, and 2,005 trees on the Patiála Navigation Channel.

II.—Spoil Banks.

Area sown in previous years, 1,396 acres; added during the year, 317 acres; remaining to be sown, 1,701 acres; total 3,414 acres.

III.—Chauki Compounds.

The work during the year was confined to the maintenance and planting of about 400 trees at various chaukis.

IV.—Financial Results.

RECEIPTS—	...	...	...	...	...	Nil.	
EXPENDITURE—	...	...	...	...	...	Rs.	253

10.—WESTERN JUMNA CANAL, KARNAL DIVISION.

I.—Avenues.

			Miles.
Total length—Canal proper, escapes, &c.	...	...	360
Avenue complete ...	...	...	250
Do. incomplete	...	...	110

Owing to want of funds no new work was done during the year. Existing trees were maintained and tended and a few vacancies filled up.

II.—Spoil Banks.

The spoil banks of the new Main Line were sown broad cast with kikar; and the result is satisfactory.

The area has not yet been ascertained. Besides this there are about 5,000 arces of "waste land of which 1,525 have been planted.

During the year about 25 acres was treated succesfully with kikar, siris and tálí. Blue gum failed entirely; and of the bamboos planted only 10% survived.

III.—Chauki Compounds.

22 trees of various kinds have been planted out at Tajawála; and forty mangoe seedlings grafted at Dadupur.

IV.—Financial Results.

RECEIPTS—					Rs.
	Sale of wood	...	...	...	1,634
	Do. of fruit	...	...	...	705
				Total	2,339
EXPENDITURS—					
	Establishment	...	...	...	768
	Sowing Spoil Banks	...	...	...	187
	Maintenance	...	...	...	924
				Total	1,879

11.—WESTERN JUMNA CANAL, HANSI DIVISION.

I.—Avenues.

					Miles.
The total length—Canal	...	...	...	...	462

No planting was done during the year. 38 miles were transferred to Delhi Branch, Western Jumna Canal.

II.—Spoil Banks.

The banks of this canal were planted many (50 ?) years ago; and the trees are now fit for felling. The Executive Engineer states, that the large number of monkeys living on the banks, will make it very difficult to renew the plantations. An attempt is now being made to sow any bare parts of the bamk with kikar seed. The thorny young plants of this tree can defend themselves. When sufficiently grown, they may serve as a defence for other plants, against the monkeys.

III.—Chauki Compounds.

Dead trees and those in danger of falling into the canal, have been cut and sold.

IV.—Financial Results.

RECEIPTS—

		Rs.
Sale of timber	...	3,686
Do. of fuel	...	1,703
Do. of Charcoal	...	158
Do. of fruit	...	450
Do. of grass, &c.	...	48
Total		6,045

EXPENDITURE——

Fuel and timber	...	1,238
Other expenses	...	314
Total		1,552

12.—WESTERN JUMNA CANAL, DELHI DIVISION.

I.—Avenues.

		Miles.
Total length	Main Canal	150
	Rajbuha	78
		228
Avenue complete		198
Do. incomplete		30

16 miles were planted with fair success with tálí, kikar, jáman and mulberry during the year.

Vacancies in former years of plantings have been filled up.

II.—Spoil Banks.

Nil.

III.—Chauki Compounds

The fruit trees already planted were watered and tended.

In the new compound at Saragthal, 27 Bombay and 10 country mangoes, together with other kinds of trees were planted out.

The mangoe gardens are a source of great profit, and are well kept up. Catalpa trees are being introduced.

IV.—Management.

In this Division also, the monkeys are said to be so numerous, that they make planting very difficult, if not impossible.

V.—Financial Results.

RECEIPTS—

		Rs.
Sale of wood	...	4,007
Do. of fruit	...	690
Total	...	4,697

EXPENDITURE—

Establishment	...	68
Avenues	...	244
Maintenance in chauki compounds		1,013
Total	...	1,325

13.—WESTERN JUMNA CANAL, NEW DELHI BRANCH DIVISION.

I.—Avenues.

		miles.
Total length	New Delhi Branch	67
	Do. Hissar do.	12
	Butána	2
	Total	81
	Avenue complete	11
	Do. incomplete	70

During the year eleven miles were planted successfully with kikar. Nurseries were started at Gangotoli and Siraspur. In the former the following kinds were planted:—400 mangoes, 200 túm, 1,200 jáman, 1,200 táli; in the latter 400 mangoes, 100 túm, 300 jáman, 600 táli, and 150 kikar.

II—Spoil Banks.

Area sown already, 3 miles in length, added during the year, 121 acres.

III.—Chauki compounds.

The chief work during the year was maintenance.

IV.—Financial Results.

RECEIPTS—	*Nil.*
EXPENDITURE—	423

14.—MUZAFFARGARH CANAL DIVISION.

Canal only just started, nothing done.

15.—SWAT CANAL DIVISION.

Nothing done as yet, beyond the planting of a few trees here and there.

APPENDIX.

Arboriculture Statement of the Punjab Districts for the year 1879-80.

Tahsíl.	1 Rain-fall in inches.	2 Locality or name of road.	3 No. of miles still unplanted or planted and failed altogether.	4 Work of previous year which still requires completion.	5 Work of the year under report: Going over or completing old work.	6 Work of the year under report: New work.	7 Remarks.
				1. Delhi.			
				I.—Roads.			
Delhi ...	36·5	Length of road to be operated on—30 miles.	20 miles ...	1 mile ...	1 mile, gaps filled up.	8 miles ...	The new work was with kikar, nim and siris seedlings and was successful on about 3 miles.
Sonepat ...	23·2	Ditto ditto 12 miles	4½ „ ...	...	...	7½ miles ...	With kikar and siris. 4 miles of this was perfect success, 1 mile still left blank, and 2½ miles failed on account of bad soil and frost.
Ballabgarh ...	30·8	Ditto ditto 16 miles	5 „ ...	4 miles ...	...	7 miles ...	The new work consisted chiefly of kikar sowing and was successful.
				II.—Groves and Plantations.			
Delhi ...	...	Mábarik Bágh, near old Cantonment	...	...	500 trees ...	...	Nearly all failed owing to frost. The trees planted last year (4,700) are all in a thriving condition and have furnished 450 fine trees for transplantation on district roads.
		Bela plántation ...	...	...	12 acres ...	...	3 acres successful, the remainder having been destroyed by Jumna inundation.
		Tatarpore—1 bigah ...	...	...	...	2,000 trees ...	Successful.
Sonepat ...	...	Jakhauli ...	...	...	...	...	Failed owing to drought.
		Gannaur ...	...	...	...	...	Ditto ditto.
		Murthal ...	...	...	...	...	Ditto ditto.
Ballabgarh ...	...	Orchard at Kutab Dák Bungalow	...	...	...	⅛ of an acre ...	546 trees successful.
		Nursery near the village of Tuglukabad.	...	...	...	Ditto ...	About 2,500 trees of various sorts successful.
		Fort Compound ...	...	...	⅑ of an acre ...	...	622 trees successful.
				2. Gurgaon.			
				I.—Roads.			
Gurgaon ...	24·25	Gurgaon Sohna road ...	10	1	23	8	Farash cuttings put in at miles 10 and 11 where other trees would not grow; only very few were successful.
		Gurgaon to Railway Station road.					A new line of road for 2 miles was planted with sissu and nim, but few survived the winter.
		Bahádurgarh road ...					Is planted with *Millingtonia*; only 1 mile uncompleted.
		Length of road undertaken (40 miles).					

Nuh	...	34·6	Nuh—Palwal road ...	13	6	3	6	Kikar and siris failed altogether owing to excessive rain.
			Taru road ...					Do. do.
			Nuh—Ferozepore road ...					1,200 old and 500 new trees extend over 3 miles.
			Length of road undertaken (24 miles).					Tahsíldárs have taken little interest in the work.
Palwal	...	35·7	Sohna road Length of road undertaken (8 miles).	4 miles ...	...	4 miles ...	4 miles ...	Blanks filled along 2 miles with plants from 3 to 5 feet high.
								Tahsíldár, lately removed, neglected arboriculture entirely.
Ferozepore	...	36·6	Ferozepore—Nuh Road—Length of road undertaken (22 miles).	17 miles ...	5 miles ...	2½ miles ...	...	Blanks filled along 2 miles with 175 trees.
								The late Tahsíldár paid no attention to arboriculture.
			II.—Groves and Planations.					
Gurgaon	...	...	Station Garden ...	25½ acres ...	...	The whole ...	...	Very successful. Nothing more required, except to protect and tend the trees still tender.
				3. KARNAL.				
				I.—Roads.				
Karnál	...	23·6	Length of road undertaken (87 miles).	43 miles ...	37 miles ...	36 miles ...	...	850 blanks filled up; 387 remain to be filled up.
Pánipat	...	24·2	Length of road undertaken (40 miles).	25 „ ...	12 „ ...	12 „ ...	...	383 blanks filled up.
Kaithal	...	11·0	Length of road undertaken (64 miles).	58 „ ...	6 „ ...	6 „ ...	...	555 blanks filled up.
				II.—Groves and Plantations.				
Karnál	...	...	1 Nursery, on 12 bighas...	...	...	200 fruit trees and 300 flowers trees	80 trees fit for transplanting and 4,940 gum seedlings.	
			1 grove at Gharunda ...	...	...	1,348 trees		
			3 groves on 3 encamping grounds ...	...	...	810 „		
			Dák Bungalow Compound	...	...	17 „		
			Police Lines ...	...	...	87 „		
			Katcheri ...	...	...	102 „		
Pánipat	...	...	Nursery, 3 bighas ...	...	...	1,000 trees fit for transplanting.		
			On 2 encamping grounds...	...	...	203 trees		
Kaithal	...	...	Nursery ...	...	...	243 trees of sorts fit for transplanting.		

Arboriculture Statement of the Punjab Districts for the year 1879-80.

Tahsíl.	1	2	3	4	5	6	7
	Rain-fall in inches.	Locality or name of road.	No. of miles still unplanted or planted and failed altogether.	Work of previous year which still requires completion.	WORK OF THE YEAR UNDER REPORT. Going over or completing old work.	WORK OF THE YEAR UNDER REPORT. New work.	REMARKS.
4. HISSAR.							
I.—Roads.							
Hissar ...	12	Hissar to Hansi *via* Maheyar (11 miles).	1 mile ...	10 miles ...	10 miles ...	...	550 trees planted.
Do. ...	...	Hissar to Hansi *via* Kharra (11 miles).	...	11 „ ...	...	...	No trees planted.
Do. ...	...	Hissar to Bhiwáni (8 miles)	6 miles ...	2 „ ...	2 miles ...	...	20 trees planted.
Do. ...	...	Hissar to Barwála (1¼ miles).	4 „ ...	7 „ ...	1	...	20 trees planted.
Hansi ...	13	Hansi to Hissar, *via* Maheyar (4 miles)	2 „ ...	2 „ ...	1	...	225 trees planted—partial success.
Do. ...	...	Hansi to Mahm (18 miles)	16½ „ ...	1½ „ ...	¼ mile ...	...	25 Do. do. do.
Do. ...	...	Hansi to Bhewáni (18 miles)	12 „ ...	6 „ ...	1 mile ...	...	65 Do. do. do.
Do. ...	...	Hansi to Tosham (12 miles)	11 „ ...	1 mile ...	...	...	No trees planted during the year.
Do. ...	...	Hansi to Gohana (22 miles)	20 „ ...	2 miles ...	400 feet ...	...	30 trees-partial success.
Do. ...	...	Hansi to Barwála (15 miles)	14 „ ...	1 mile ...	500 feet ...	...	50 Do. do.
Do. ...	...	Hansi to Karnál (20 miles)	19 „ ...	1 „ ...	300 feet ...	...	25 trees—partial success.
Bhewáni ...	14	Bhewáni to Hansi (7 miles)	6½ „ ...	½ „ ...	...	...	No planting done.
Fatahabad ...	15	Fatahabad to Hissar (18 miles).	17 „ ...	1 „ ...	300 feet ...	...	126 trees planted.
Do. ...	...	Fatahabad to Sirsa (10 miles)	9 „ ...	1 „ ...	300 feet ...	...	170 trees failed.
Barwala ...	12	Barwala to Hansi (7 miles)	6¾ „ ...	¼ „ ...	¼ mile ...	...	Of 1,672 trees reported last year only 127 survived, the rest died for want of water.
Do. ...	...	Barwala to Hissar (8 miles)	7 „ ...	1 „ ...	1 „ ...	...	Of the trees reported last year 1,601 died.
Do. ...	...	Barwala to Tohanna (24 miles).	23 „ ...	1 „ ...	...	...	Do. do. 1,070 trees died.

II.—Groves and plantations.

Hissar ...	...	17 different plots (47 acres)	Successfully planted	...	...	967 trees ...	Total No. of trees 8,514.
Hansi ...	...	5 plots in different places	...	...	...	242 trees ...	A success. Nursery was established at the encamping ground, to supply seedlings for the district.
Bhíwáni ...	...	9 plots in different places	...	...	...	368 trees planted	A success,
Fatahabad ...	...	11 localities ...	...	...	...	407 trees ...	Do. do.
Barwála ...	...	7 do. ...	...	...	...	350 „ ...	158 trees succeeded.

5. ROHTAK.

I.—Roads.

Rohtak ...	22	Length of road undertaken, (58½ miles)	38¾ miles ...	15½ miles ...	15½ miles replenished, 207 gaps filled	2½ miles, 215 trees planted	Gaps filled in one mile successful, and trees planted on 1½ miles doubtful.
Sámpla ...	23	Do. 55 miles ...	43½ „ ...	8 „ ...	7 miles, 90 blanks filled	3 miles, 585 trees planted	Of the trees planted on the 3 miles, 83 per cent. successful.
Jhajjar ...	18	Do. 92 miles ...	69¾ „ ...	35 „ ...	35 miles, 404 blanks filled	17 miles, 5,202 trees planted	Trees planted on 17 miles, 49 per cent. successful.
Gohána ...	23	Do. 55¾ miles ...	29 „ ...	...	26 miles, 964 gaps filled	113 trees ...	67 per cent. successful.

II.—Groves and Plantations.

Nil.

6. SIRSA.

I.—Roads.

Sirsa ...	11·51	Delhi road from Sirsa to Pattidapur (14 miles)	12½ miles ...	1½ miles ...	1½ miles ...	...	65 sissu trees planted on 1½ miles, 7 killed by white ants.
Do. ...	...	Main Traffic road from Sirsa to Phúkalián (6 miles)	5 „ ...	1 mile ...	1 mile ...	...	33 kikar trees of previous years died from drought.
Do. ...	...	Abdhar road from Sirsa to Bandowála (24 miles)	23 „ ...	1 „ ...	1 „ replenished	...	40 sissu trees planted; 9 died owing to injury by white ants.
Do. ...	...	Darba road from Sirsa to Darba (10 miles)	9½ „ ...	1 „ ...	1 „ replenished	...	49 Do. do. 15 died; from injury by white ants.
Dabwáli ...	12·47	Main Traffic road from Khairaka to Mohawala (44 miles whole length)	14 „ ...	30 „ ...	30 miles ...	...	44 sissu and pipal trees planted, 24 died from drought.
Fázilka ...	9·27	Main Traffic from Mohawala to Muazim Ferry road (46 miles whole length)	...	46 „ ...	46 „ ...	...	Kikar and beri seeds sown; 300 germinated, 200 died. 200 kikar and sissu trees planted in gaps, 20 died from injury by white ants; also kikar and beri seed sown in blank places; 300 germinated, of which 200 died.

Arboriculture Statement of the Punjab Districts for the year 1879-80.—continued.

Tahsíl.	1	2	3	4	5	6	7
	Rain-fall in inches.	Locality or name of road.	No. of miles still unplanted or planted and failed altogether.	Work of previous year which still requires completion.	WORK OF THE YEAR UNDER REPORT. Going over or completing old work.	New work.	REMARKS.
			II.—Groves and Plantations.				
Sirsa ...	...	Dhanur ...	1 acre ...	...	900 trees ...	420 trees ...	Road side gaps supplied from them.
		Sirsa ...	1 „ 25 poles	...	60 „ ...	...	Do. do. do.
		Various villages ...	...	...	185 „ planted ...	...	To fill gaps, 70 died from drought.
Dabwáli ...	...	At 5 encamping grounds, village plots	...	...	276 „ ...	...	To fill gaps, 181 trees died from drought.
Fázilka ...	...	Tahsíl ...	...	...	200 trees ...	...	To fill gaps.
		Village plots ...	...	...	...	200 trees ...	Do. 100 enjured by blight and white ants.
			7. UMBALLA. *I.—Roads.*				
Umballa ...	25·7	Length of road undertaken during the year, 70½ miles.	25 miles ...	45½ miles ...	27 miles, blanks filled with 2,014 trees	...	Sissu, siris, mulberry, nim. and lasúra. 513 failed rest successful.
Jagádhri ...	30·6	Do. 40 „ ...	17 „ ...	23 „ ...	10 miles, blanks filled with 158 trees	...	Sissu, siris, mulberry, nim. 58 trees died, rest successful.
Pipli ...	21·2	Do. 130 „ ...	68 „ ...	62 „ ...	34 miles, blanks filled with 1,062 trees	...	Siris, sissu, mulberry, nim. 272 trees failed, rest successful.
Rúpar ...	25·2	Do. 51 „ ...	...	51 „ ...	20 miles, blanks filled with 353 trees	...	Sissu, siris, mulberry, nim. 121 trees died. rest successful.
Kharar ...	21·8	Do. 46 „ ...	5 „ ...	41 „ ...	19 miles, blanks filled with 2,255 trees	...	Sissu siris, mulberry, nim. 895 trees failed. rest successful.
Naraingarh ...	14·3	Do. 96 „ ...	72 „ ...	24 „ ...	12 miles, blanks filled with 675 trees	...	Sissu, siris, mulberry, nim. 175 trees failed, rest successful.

8. Ludhiana.

I.—Roads.

Ludhiána	...	21·2	Kalka road, length of road (26 miles)	1 mile	...	1 mile	...	993 trees planted to fill blanks.	...	The season was such a dry one that a very large staff of bhistis had to be kept up to water the young trees on road-sides—not much new work could be taken in hand.
Do.	...	...	Kotla to Ludhiána (16½ miles)	5 miles	...	5 miles	...	150 trees planted to fill blanks.	2½ miles, 990 trees planted	
Jagraon	...	17·7	Sidhonwall to Raekot (25 miles)	8 „	...	8 „	...	2,249 trees planted to fill blanks.	2 miles, 850 trees planted	
Do.	...	...	Kookree road 5 miles	4 „	...	...		...	...	
Samrála	...	22·2	Samrála to Máchiwára (6½ miles)	...		...		175 trees planted to fill blanks.	...	
Do.	...	...	Samrála to Khava (9 miles)	...		...		390 trees planted to fill blanks.	...	

9. Simla.

No arboriculture in this District.

10. Jullundur.

I.—Roads.

Jullundur	...	22	Length of road to be operated on (26 miles)	7 miles	...	19 miles	...	8¼ miles replenished	1¾ miles	... Chiefly sissu and siris plants.
Nakodar	...	21	Do. do. (6 „)	...		6 „	...	6 miles, 1,200 trees planted	...	All sissu.
Phillour	...	19	Do. do. (41½ „)	17 miles	...	16 „	...	4½ miles replenished	5 miles	... Blanks filled and new work done with farash cuttings and sissu trees.
Nawashahr	...	27	Do. do. (40½ „)	9½ „	...	26½ „	...	9 miles ...	4 „	... Blanks filled and new work done by planting sissu, siris and tun plants.

11. Hoshiarpur.

I.—Roads.

Hoshiárpur	...	23	Length of road underteken (87 miles)	55 miles	...	32 miles	...	13 miles ...	11 miles, 725 trees	175 died of cold and drought.
Dasúya	...	...	Do. (141 miles)	53 „	...	88 „	...	36 „ ...	8 miles with 13,997 trees	
Garhshankar	...	...	Do. (140 „)	25 „	...	115 „	...	55 „ ...	55 miles with 7,236 trees	1,071 died of cold and drought.
Una	...	...	Lenght of road undertaken (203 miles)	151 „	...	52 „	...	19 „ ...	5 miles with 2,253 trees	333 Do. do. do.
Amb	...	...	Do. (82 miles)	70 „	...	12 „	...	4 „ ...	2 miles, 3,846 trees	152 Do. do. do.

Arboriculture Statement of the Punjab Districts for the year 1879-80.—continued.

Tahsíl.	1	2	3	4	5	6	7
	Rain-fall in inches.	Locality or name of road.	No. of miles still unplanted or planted and failed altogether.	Work of previous year which still requires completion.	WORK OF THE YEAR UNDER REPORT. Going over or completing old work.	New work.	REMARKS.
				II.—Groves and Plantations.			
Hoshiárpur ...	...	Tahsíl compound and encamping ground.	...	...	...	100 acres, 1,845 trees	382 died of cold and drought.
Dasúya ...	...	Do. ...	...	89 acres. ...	...	...	
Garhshankar ...	...	Do. ...	...	112 „ ...	75 acres	37 acres, with 1,925 trees.	
Una ...	...	Do. ...	...	54 „ ...	14 „ ...	26 acres with 307 trees	25 died of cold and drought.
Amb ...	...	Do. ...	...	23 „ ...	5 „ ...	483 trees ...	38 died do. do.
				12. KANGRA. *I.—Roads.*			
Núrpur ...	89	Illaqua Núrpur, length of road (95 miles)	49 miles ...	46 miles ...	46 miles, 1,409 blanks filled	7 miles * with 2,315 trees	* All new work failed.
Kángra ...	79	Do. (77 „) ...	32 „ ...	45 „ ...	45 miles, 3,923 blanks filled		
Dehra ...	59	Length of road (94 miles)	49 „ ...	45 „ ...	45 miles, 2,350 blanks filled	2 miles, 623 trees planted.	
Hamirpur ...	51	Do. (130 miles) ...	81 „ ...	49 „ ...	49 miles, 8,000 blanks filled	2,000 trees planted.	
Pálampur ...	...	Do. (66 „) ...	40 „ ...	26 „ ...	26 miles, 1,702 blanks filled	...	No new work undertaken.
Kulu ...	46·9	Do. (90 „) ...	22 „ ...	68 „ ...	59 miles, 1,000 blanks filled	9 miles, 1,000 trees planted.	

13. Amritsar.

I.—Roads.

Amritsar	...	25·5	Amritsar-Tarn Táran, length 12 miles	...		12 miles	...	655 blanks filled	...		...	Of which 95 failed and 105 proved partially successful. 455 succeeded.
Do.	...	...	Gehree to Jandiála, length 2½ miles	...		...		...		888 trees	...	50 failed, 100 partial success, 738 succeeded.
Do.	...	...	Amritsar-Siálkot, length 22 miles	13 miles	...	9 „	...	455 blanks filled		...		70 failed, 80 partial success, 305 do.
Do.	...	...	Amritsar-Mujdhar, length 11½ miles.	7 „	...	4½ „	...	145 „	...	...		15 failed, 20 do. do., 110 do.
Do.	...	...	Amritsar-Fatahgarh, length 14½ miles	3½ „	...	11 „	...	527 „	...	...		70 failed, 80 do. do., 377 do.
Do.	...	...	Amritsar-Govindpur, length 23 miles	19 „	...	4 „	...	137 „	...	...		80 failed, 10 do. do., 47 do.
Do.	...	...	Fatahpur-Mahonkee, length 5 miles	...		5 „	...	540 „	...	...		70 failed, 85 do. do., 385 do.
Do.	...	...	Wazír Bhullar to Batála, length 12¼ miles	9 „	...	3½ „	...	...		1,260 trees planted		All succeeded.
Tarn Táran	...	24·2	Tarn Táran to Gharenda, length 19 miles	18 „	...	1 mile	...	190 blanks filled		290	do.	40 failed, 60 partial success, 380 succeeded.
Ajnála	...	22·6	Gujránwála road, length 22 miles	13 „	...	9 miles	...	690 „	...	645	do.	Of the old work, 495 succeeded, 105 partially, 90 failed. New work a success.
Do.	...	...	Chogoan-Allaur, length 7 miles	...		5 „	...	175 „	...	1,154	do.	Of the new work 90 failed, 170 partial success, 914 succeeded. Of the old work 135 succeeded, 20 failed, and 20 partial success.

14. Gurdaspur.

I.—Roads.

Gurdáspur	...	30·1	Length of road to be operated on during year, (38 miles)	...		38 miles	...	38 miles	...	...		142 sissu, 573 bakain, 785 mulberry, 200 willow 15 tun. 413 mangoe, 86 jaman; in all 2,214 trees planted, out of which 316 failed, namely 58 sissu, 62 bakain, 49 mulberry, 139 mangoe and 8 jaman.
Shakargarh	...	...	Length of road to be operated on (54 miles)	...		54 „	...	54 „	...	...		300 kikar, 1,550 mulberry, 1,795 sissu; in all 3,645 trees planted, of which 50 died.
Batála	...	...	Do. (43 miles) ...	...		43 „	...	43 „	...	...		28 mangoe, 631 mulberry, 15 bakain, 593 sissu, 10 jaman; in all 1,277 trees planted, of which 6 died.
Pathánkot	...	...	Do. (15 miles) ...	...		15 „	...	15 „	...	...		710 mangoe, 240 jaman, 950 trees planted, of which 100 mangoe and 40 jaman died.

Arboriculture Statement of the Punjab Districts for the year 1879-80.—continued.

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			II.—Groves and Plantations.				
Gurdáspur ...	...	4 gardens, 47 acres ...	...	47 acres ...	1,019 trees planted	...	Mostly fruit trees.
Do. ...	...	Tun grove ...	...	3 „ ...	3 acres ...	...	36 jáman trees planted; all lived.
		Mangoe garden ...	...	3 „ ...	3 „ ...	...	95 mangoe ditto; 13 died.
		3 sissu groves ...	6 acres ...	1 acre ...	1 acre ...	6 acres ...	New work consisted chiefly of sissu and bakain planting.
		China mulberry grove ...	2 „ ...	...	...	2 „ ...	1,600 trees, raised from cuttings were planted out and all succeeded.
Shakargarh ...	...	Tahsíl garden ...	...	...	166 trees planted	...	54 mulberry, 28 plum, 30 jáman, 32 mangoe, 12 yellow plum and 10 palm trees planted.
Do. ...	...	Rest House ...	...	...	...	200 trees ...	10 mangoes, 40 jáman, 150 sissu.
Pathánkot ...	...	Tahsíl garden, 3 acres ...	...	...	330 trees planted	...	All fruit trees.
			15. Siálkot. *I.—Roads.*				
Siálkot ...	27	Length of road undertaken during year, 88 miles	2 miles ...	86 miles ...	86 miles with 7,050 trees	...	Sissu, kikar and siris.
Zafarwál ...	...	Length of road undertaken, 14 miles	½ mile ...	13½ „ ...	13½ miles with 1,200 trees	...	200 died owing to drought.
Raya ...	...	Length of road undertaken, 48 miles	...	48 „ ...	48 miles with 4,100 trees	...	2,700 died from excessive drought.
Pasrúr ...	...	Length of road undertaken, 163 miles	9 miles ...	154 „ ...	154 miles with 10,047 trees	...	Out of these, 4,123 died owing to drought; sissu and siris succeeded best.

II.—Groves and Plantations.

Siálkot	...	...	District Fund Garden, 1 acre	...		...	200 trees planted	1 acre	...	Planted with seedlings and cuttings of fruit trees of sorts, also forest trees ; such as sissu, tallow tree, behara, classia fistula.
Pasrúr	...	...	Garden ...	...		...	46 „		...	1,500 cuttings of Chinese mulberry have all succeeded.
			Gulashah Jail ...	...		...	106 „		...	Mostly fruit trees.
										Sissu and siris.

16. LAHORE.

I.— Roads.

Lahore	...	16·4	Harke to Lahore (15 miles)	4 miles	...	11 miles	...	4 miles with 1,500 trees		...	Soil on this road very bad; canal irrigation introduced.
Sharakpur	...	6·9	Rájghát to Bucheke (42 miles)	...		42 „	...	...		...	Owing to insufficiency of funds, no trees planted on this road.
Do.	...	...	Sharakpur to Shekhupura (15 miles)	...		15 „	...	...		...	Ditto ditto ditto.
Do.	...	...	Sharakpur to Gajah (12 miles)	...		12 „	...	...		...	Ditto ditto ditto.
Chunián	...	19·9	Chunián to Khudián (19 miles)	5 miles	...	13 „	...	2 miles ...	½ mile	...	Planted with trees.
Do.	...	19·9	Chunián to Kanganpur (16 miles)	14 miles	...	2 „	...	1 mile replenished		...	
Do.	...	...	Chunián to Hujra (9 miles)	1 mile	...	8 „	...	1 mile replenished		...	Owing to scarcity of water success is difficult.
Do.	...	...	Chunián to Chánga Mánga (9 miles)	2 miles	...	7 „	...	7 miles replenished		...	Trees watered by bhistís.
Kasur	...	...	Kasur to Khem Karn (6 miles)	...		6 „	...	6 miles ...		...	
Do.	...	...	Ganda Singhwála to Chunián (10 miles)	4 „	...	6 „	...	6 „ ...		...	Soil good. Success anticipated.

18. GUJRANWALA.

I.—Roads.

Gujránwála	...	16	Length of road undertaken during year, 26 miles	18 miles	...	8 miles	...	2 miles—blanks filled with 600 trees	1,000 trees	...	New work : sissu and siris. Successful.
Wazirabad	...	23	Do. 22 miles ...	8 „	...	14 „	...	6 miles—blanks filled with 1,000 trees		...	Successful.
Háfizabad	...	16	Do. 93 miles ...	81 „	...	12 „	...	2 miles—blanks filled with 700 trees	400 trees	...	Partial success. Failure owing to inferior soil.

Arboriculture Statement of the Punjab Districts for the year 1879-80.—continued.

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				II.—Groves and Plantations.			
Gujránwála ...	...	At Tahsíl ...	...	...	...	275 trees ...	Successful.
Wazirabad ...	...	At Serai ...	...	2 acres ...	80 trees ...	...	Ditto.
		At Seroka ...	...	...	...	85 trees ...	Ditto.
		At Baradari Rámnagar ...	...	...	...	24 „ ...	Ditto.
				17. FEROZEPORE. *I.—Roads.*			
Ferozepore ...	10	City to Zíra, 5 miles ...	...	5 miles ...	240 blanks filled	60 trees planted	Partial success.
		Do. to Makhu, 14 miles	9 miles ...	5 „ ...	200 „ „	...	Ditto.
		Do. to Malwal, 5 „ ...	...	5 „ ...	1,430 „ „	70 trees planted	Ditto.
		Do. to Khai, 6 „ ...	...	6 „ 290 blanks	290 „ „	90 „ „ ...	Ditto.
		Do. to Gandu, 2 „ ...	...	2 „ 467 blanks	467 „ „	33 „ „ ...	Ditto.
		Do. to Ghat, 4 „ ...	...	4 „ ...	...	...	
		Do. to bridge near graveyard, 2 miles	...	2 „ ...	...	...	
		Cantonment to Jhok, 4 miles	1 mile ...	3 „ ...	291 blanks filled	9 trees planted...	Ditto.
		Ditto to Khai, 4 „	...	4 „ ...	253 „ „	47 „ „ ...	Ditto.
		Ditto to Zíra, 12 „	4 miles ...	8 „ ...	1,840 „ „	160 „ „ ...	Ditto.
		Ditto to Ghat, 7 „	...	7 „ ...	...	...	
		Ditto to Malwal, 3 „	...	3 „ ...	...	...	
		Ditto to Mirn Shahpur, 7 miles	...	7 „ ...	2,275 blanks filled	75 trees planted	Ditto.
		Race course 4 miles, ...	...	4 „ ...	...	...	
		Khai to Bhura, 12 miles ...	10 miles ...	2 miles ...	235 blanks filled	1,865 trees planted	1,850 new trees failed.
		Prijarana to Mudki, 10 miles	10 „ ...	...	...	...	
		Khai to Mumdot, 8 „	2 „ ...	6 miles ...	...	*1,990 trees planted	*Partial success.
Zíra ...	6·3	Natha to Kawan, 13 „	8 „ ...	5 „ ...	...	...	
		Ferozepore to Kishampurah, 38 miles	19 „ ...	19 „ ...	...	†2,670 trees planted	†2,125 failed.

		Ferozepore to Indrisa ferry, 17 miles	7 miles ...	10 miles ...	...	...	
		Harike ferry to Bhandar Killan, 26 miles	26 „ ...	...	...	300 trees planted	Partial success.
		Harike ferry to Loháru, 26 miles	26 „ ...	...	...	400 trees planted	Do.
		Harike ferry to Farídkot, 23 miles	13 „ ...	10 miles ...	...	‡ 5,100 trees planted	‡4,198 failed.
		Mouzah to Zíra, 16 miles...	6 miles ...	10 „ ...	...	2,600 trees planted	2,215 failed.
		Kot Isa Khan to Eata (6 miles)	6 „ ...	...	...	...	
Moga ...	8·8	Thana Moga to Kawan ferry (39 miles)	1 mile ...	38 miles. ...	...	...	No new work done.
		Harike to Himatpura (24 miles)	8 „ ...	16 „ ...	...	...	Ditto.
		Bágha parána to Kot Kapúra (12 miles)	...	12 „ ...	...	...	Ditto.
		Moga to Zíra (16 miles) ...	6 miles ...	10 „ ...	...	2,000 trees planted	Partial success.
		Bágha purána to Milwa (6 miles)	6 „ ...	...	...	2,000 „ „ ...	Do.
Muktsar ...	...	Muktsar to Mansingwála (13 miles)	13 „ ...	...	770 blanks filled	214 „ „ ...	Do.
		Muktsar to Bhaillanah (18 miles)	18 „ ...	...	266 „ „ ...	52 „ „ ...	Do.
		Muktsar to Bhaggehki (21 miles)	21 „ ...	...	46 „ „ ...	155 „ „ ...	Do.
		Muktsar to Karainwála (12 miles)	12 „ ...	...	189 „ „ ...	57 „ „ ...	Do.
		Muktsar to Sarai Wanga (10 miles)	10 „ ...	...	372 „ „ ...	154 „ „ ...	Do.
		Pindi to Bambar Wattoo (25 miles)	25 „ ...	...	2,699 „ „ ...	749 „ „ ...	Do.
				II.—Groves and Plantations.			
Ferozepore ...	...	20 groves or plots ...	...	...	...	...	No new work done.
Zíra ...	...	15 „ ...	...	...	...	862 trees planted	171 failed.
Moga ...	...	60 „ ...	...	...	...	360 „ „ ...	
Muktsar ...	...	10 „ ...	...	...	...	960 „ „ ...	

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			19. Rawalpindi. *I.—Roads.*				
Rawalpindi ...	34	Chauntra to Fulsa (16 miles)	16 miles ...	...	3,400 trees planted	150 trees planted	Of the old work 1,400 failed and 1,600 were a partial success.
		Kotha to Nara Naidan (10 miles)	10 „ ...	...	850 trees planted	150 „ „ ...	„ 150 failed and 400 was a partial success.
		Rawalpindi to Khursun Gujar (13 miles)	11 „ ...	2 miles ...	1,500 trees planted	100 „ „ ...	„ 600 failed and 300 partial success.
		Saham to Pind Sangral (5 miles)	5 „ ...	...	600 „ „ ...	20 „ „ ...	„ 100 failed and 100 partial success.
		Serai Khola to Thatha Khalil (7 miles)	7 „ ...	...	430 „ „ ...	40 „ „ ...	Of the old work 130 failed and 100 partial success.
		Mehra Kallan to Badial (5 miles)	5 „ ...	...	1,019 „ „ ...	40 „ „ ...	„ 210 failed and 9 partial success.
Fátahjang ...	...	Fátahjang to Kala Pari (33 miles)	18 „ ...	15 miles ...	3,611 „ „ ...	130 „ „ ...	„ 1,258 failed; of the new work 105 failed.
		Hun to Runotra (15 miles)	11 „ ...	4 „ ...	2,736 „ „ ...	159 „ „ ...	Of the old 347 and of the new work 120 failed.
		Chohan to Dhadumbar (35 miles)	26 „ ...	9 „ ...	2,759 „ „ ...	121 „ „ ...	„ 159 and of the new 95 failed.
		Road round Fátahjang (1 mile)	1 mile ...	...	322 „ „ ...	160 „ „ ...	„ 52 and of the new 108 failed.
Kahuta ...	...	Kallar to Riwát (9 miles)	7 miles ...	2 „ ...	2,127 „ „ ...	210 „ „ ...	New work all failed.
		Mandra to limits of Kahuta (11 miles)	9 „ ...	2 „ ...	1,665 „ „ ...	50 „ „ ...	Ditto.
				II.—Groves and Plantations.			
Fátahjang ...	...	Tahsíl compound ...	...	...	61 trees planted	125 trees ...	Of which 115 failed.
		Garden ...	...	...	70 „ „ ...	1,115 „ ...	Ditto 610 failed.

				20. JHELUM.			
				I.—Roads.			
Jhelum ...	29	District School to New Bazár (4 furlongs)	...	...	2 furlongs, 1,400 trees planted	...	Sissu trees to replace those which have died.
		Jhelum to Kala (3 miles)	2 miles ...	1 mile ...	1 mile, 100 trees	...	Ditto ditto ditto.
		Kutchery to Cantonment (1 mile)	½ mile ...	1 „ ...	½ „ „ ...	...	Ditto ditto ditto.
		Kutchery to Kala (3 miles)	2 miles ...	1 „ ...	1 mile, 190 trees	...	Ditto ditto ditto.
Pind Dádan Khan	16·8	Kandwal to Bhelowal (15 miles)	10 „ ...	...	...	6 miles, 2,200 trees	Kikar and sissu failed.
		Pind Dádan Khan to Chuk Hamid (10 miles)	10 „ ...	...	...	10 „ 2,150 „	Ditto ditto.
		Pind Dádan Khan to Dalwal Road (19 miles)	2 „ ...	...	...	1½ mile 254 „	Kikar failed.
		Kalar Kahar to Choy Sadun Shah (16 miles)	1 mile ...	...	...	1 mile 200 „	50 failed.
				II.—Groves and Plantations.			
Jhelum ...	...	Public garden ...	...	...	...	9,500 trees ...	Of which 2,300 failed.
		6 small plots ..	...	....	...	387 „ ...	All successful.
Chakwál ...	21·8	Station roads ...	...	...	...	517 „ ...	Successful.
		Tank and Garden ...	...	...	...	1,218 „ ..	Some of these failed.
Talagang ...	15·5	Station roads ...	...	...	9 miles, 1,460 trees	2 miles, 1,050 trees	550 of the old and 610 of the new work failed.
		Tahsíl compound ...	...	...	60 trees ...	50 trees	100 of these failed.
				21. GUJRAT.			
				I.—Roads.			
Gujrat ...	32	Gujrat towards Bhimbur (24 miles)	...	...	6 miles ...	...	Where required, gaps filled with sissu.
		Gujrat to Phálian, 32 miles	...	...	½ mile ...	...	Ditto ditto.
		Loop Road to Gujrat Railway Station (¾ mile)	...	...	¾ „ ...	...	Ditto ditto.
		Circular Road near Sadr Distillery at Gujrat (1 mile)	...	...	1 „ ...	...	Ditto ditto.
				22. SHAHPUR.			
				I.—Roads.			
Shahpur ...	10	Length of road undertaken (7 miles)	3 miles ...	4 miles ...	578 trees planted, of which 302 died	3 miles, 909 trees planted	Of which 794 died.
Bhera ...	11·2	„ (38 „)	6 „ ...	32 „ ...	12 miles, 1,685 trees	...	Of which 1,328 died.
Khusháb ...	5·4	„ (24 „)	19 „ ...	5 „ ...	4 „ 500 „	...	All failed owing to drought.

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					Going over or completing old work.	New work.	
			II.—Groves and Plantations.				
Shahpur ...	...	8 groves at Shahpur ...	...	...	174	1,295	*Old work* : 32 trees died. *New work* : 440 trees died.
			23.—Mooltan.				
			I.—Roads.				
Mooltan ...	3	Mooltan and Baháwalpur road (25 miles)	23 miles ...	2 miles ...	2 miles, 80 trees	...	
		Mooltan and Shujabad road (16 miles)	13 „ ...	3 „ ...	3 „ 80 „ ...	...	
		Mooltan and Bander Ghat road (5 miles)	2½ „ ...	2½ „ ...	2½ „ 70 „ ...	...	
		Mooltan and Sher Shah road (12 miles)	9 „ ...	3 „ ...	1 mile 10 „ ...	...	
Shujabad ...	1·8	Railway station road, (1¾ mile)	...	1¾ mile ...	1¾ mile ...	...	200 trees planted, of which 23 died.
Lodhrán ...	0·9	Mooltan and Baháwalpur road (23 miles)	15 miles ...	8 miles ...	8 miles, 65 trees	...	
		Lodhrán and Jalálpur road, 24 miles	12 „ ...	12 „ ...	6 „ 215 „	...	
		Lodhrán and Karor road, 7 miles	2 „ ...	5 „ ...	4 „ 30 „	...	
		Old Customs line, 47 miles	27 „ ...	20 „ ...	11 miles, 75 „	...	
Mailsi ...	2·8	Mailsi and Mooltan road (28 miles)	17 „ ...	11 „ ...	11 „ ...	...	515 sissu and kikar trees planted, of which 105 died.
		Mailsi and Juir Jhal (32 miles)	26 „ ...	6 „ ...	6 „ ...	...	237 ditto ditto, ditto 77 died.
		Luddan to Sarai Sidhu Tahsíl boundary (33 miles)	32 „ ...	1 mile ...	1 mile ...	...	90 ditto ditto, ditto 44 do.
		Karmpur and Tiba road (38 miles)	30 „ ...	8 miles ...	8 miles ...	...	280 ditto ditto, ditto 95 do.

		Kotta Naranjan and Dhanol road, 9 miles	7 miles ...	2 miles ...	2 miles ...	...		250 sissu and kikar trees planted, of which 52 died.
		Mailsi and Kotta Naranjan road, 24 miles	18 „ ...	6 „ ...	6 „ ...	...		345 ditto ditto ditto 96 do.
		Karor and Dunyapur road, 25 miles	6 „ ...	19 „ ...	6 „ ...	...		355 ditto ditto ditto 107 do.
		Karor and Jhok Saleh road, 17 miles	12 „ ...	5 „ ...	5 „ ...	...		235 ditto ditto ditto 88 do.
		Karor and Mohranwála ferry road, 15 miles	...	15 „ ...	15 „ ...	...		275 ditto ditto ditto 92 do.
		Karor and Shahpur road, 9 miles	6 miles ...	3 „ ...	3 „ ...	...		175 ditto ditto ditto 65 do.
Sarai Sidhu ...	5·5	Mooltan and Lahore road, 48 miles	45 „ ...	3 „ ...	3 „ ...	...		58 ditto.
				24. JHANG.				
				I.—Roads.				
Jhang ...	4·2	Jhang Shahpur road, 33 miles	31¾ miles ...	1¼ mile ...	1¼ mile 157 trees	...		
		Jhang to Karorora road, 2 miles	...	1 „ ...	1 „ 95 „	...		
		Jhang Chiniot road, 1 mile	...	1 „ ...	1 „ 79 „	...		
		Jhang to Khaki Shah, 1 mile	...	1 „ ...	1 „ 132 „	...		
		Jhang to Trimmu, 14 miles	12 miles ...	1 „ ...	1 „ 100 „	...		
		Jhang to Lahore, 50 miles	48 „ ...	1 „ ...	1 „ 41 „	...		
Chiniot ...	6·6	Jhang to Chiniot (52 miles)	50 „ ...	1 „ ...	1 „ 574 „	...		
Shorkot ...	5·5	Jhang to Shorkot (34 miles)	31 „ ...	2 miles ...	2 miles, 106 trees	...		
				II.—Groves and Plantations.				
Jhang ...	...	New garden at Sadr, about 5 acres	...	...	...	1 R-5P—4,000 cuttings		Nursery only.
Shorkot ...	...	Tahsíl garden, 2 acres ...	...	...	...	5 poles, 47 trees planted.		
				25. MONTGOMERY.				
				I.—Roads.				
Montgomery ...	5							
Dipálpur ...	0·9	Montgomery Dipálpur road—length of road 38 miles	32 miles ...	6 miles ...	...	...		2,711 trees of previous year died.
Pákpattan ...	5·4	Montgomery Pákpattan road—length of road 29 miles	28 „ ...	1 mile ...	Blanks filled with 73 trees	...		215 ditto ditto.

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				II.—Groves and Plantations.			
Montgomery ...	...	Various ...	...	...	3,340 trees ...	175 trees ...	200 trees of previous year died.
		Dák Bungalow—Chíchawatni—1 acre	...	...	140 „ ...	...	
Gugera ...	...	Gugera, 8 murlas, ...	...	...	350 „ ...	...	Of these 40 died.
		16 plots at different places	...	Small groups ...			
Dipálpur ...	...	Attári, 9 acres ...	...	9 acres ...	...	...	511 trees of previous year died.
		Tahsíl garden ...	...	1 acre ...	...	...	125 ditto ditto.
				26. MUZAFFARGARH. *I.—Roads.*			
Muzaffargarh ...	1·5	Muradabad road, 49 miles	42 miles. ...	5 miles ...	15 gaps filled ...	166 trees planted	Mostly sissu; 25 failed.
		Taleri garden to Khangar, 3 miles	...	3 „ ...	120 „ ...	...	Mostly sissu. Successful.
		Muzaffargarh to Kuraishi, 2 miles	1 mile ...	1 mile ...	...	320 trees planted	Mostly sissu; 30 failed.
		Jail road, ¾ mile ...	...	¾ „ ...	25 gaps filled ...	...	All sissu. Successful.
		Alípur road, 26 miles ...	13 miles ...	13 miles ...	91 „ ...	...	Mostly sissu.
Alípur ...	1·6	Rohilánwáli to Dháka, 53½ miles	1½ mile ...	6 „ ...	577 „ ...	...	All sissu. Partial success.
		Shahr Sultán to Jatoi, 11 miles	10 miles ...	1 mile ...	14 „ „	...	Partial success.
		Jatoi to Alípur, 10 miles	9 „	1 „ ...	160 „ „	...	Do. 80 sissu, 60 siris and 20 mulberry trees planted.
Sanáwan ...	3·1	Muhammadkot to Ahsanpur, 36 miles	...	36 „ ...	1,102 „ „	...	677 failed—rest partial success—all sissu.
				II.—Groves and Plantations.			
Muzaffargarh ...	...	Plot of ground on Kuraishi road	...	...	...	15 trees ...	8 ber, 7 pipal.
		Do. on Khangarh road.	...	...	...	130 „ ...	All sissu.

		Plot of ground on station road	...	...	...	25 trees	...	6 sissu, 17 jaman and 2 mulberry trees.
		Cemetery ...	...	...	...	297 „	...	15 failed—mostly sissu.
		Encamping ground ...	...	...	...	187 „	...	46 failed ; 152 sissu, 12 ber and 23 siris.
		Church compound ...	...	...	...	39 „	...	4 sissu, 35 mulberry.
		Session house ...	...	...	...	20 „	...	12 jaman, 5 sissu 3 mulberry.
		Police hospital ...	...	...	...	20 „	...	All sissu.
		Police rest house at Khangarh	...	...	...	20 „	...	Ditto.
		Garden on Kuraishi and Kinjpur road	...	...	...	42 „	...	39 sissu, 3 pipal
Muzaffargarh ...	...	Taleri garden ...	...	...	...	310 fruit trees	...	80 grapes, 50 fig and 175 peaches, &c.
		Kuraishi encamping ground	...	...	...	171 trees	...	Mostly sissu.
Alipur ...	...	Jatoi „ ...	...	...	...	86 „	...	Of which 40 failed.
		Khairpur „ ...	...	...	...	80 „	...	Ditto 57 „
Sanáwan ...	...	Sanáwan „ ...	...	...	...	102 „	...	All sissu, 5 „
		Mírwáli „ ...	...	...	...	13 „	...	Ditto.
		Kot Adu „ ...	...	...	...	104 „	...	Ditto 48 failed
		Munna School compound	...	...	...	5 „	...	
		Ahsanpur ditto ...	...	...	...	2 „	...	
				27. Dera Ismail Khan.				
				I.—Roads.				
Dera ...	10	Main Trunk road, Dera Ismail Khan to Bannu, 36 miles	35 miles ...	...	...	1 mile	...	Single line of sissu trees planted on both sides.
Tánk ...	10	Main Trunk road, Dera and Tánk road, 40 miles	39 „ ...	1 mile ...	100 trees ...	...		
Bhakkar ...	8·5	Kaharkot to Kot Sultan, 118 miles	104 „ ...	14 miles ...	200 „ ...	1,000 trees	...	
		Mail cart road, Bhakkar to Jhang (44 miles)	...	44 „ ...	...	About 1,000 trees		
				II.—Groves and Plantations.				
Dera ...	...	Main Trunk road ...	...	24 groves planted out	800 trees			These groves are planted at distances of about ½ a mile for the first 22 miles.
Tánk ...	...	Ditto ...	...	20 groves ...				Rain-fall too small to allow of avenues being attempted.

Arboriculture Statement of the Punjab Districts for the year 1879-80.—continued.

Tahsíl	1 Rain-fall in inches.	2 Locality or name of road.	3 No. of miles still unplanted or planted and failed altogether.	4 Work of previous year which still requires completion.	5 Work of the year under report: Going over or completing old work.	6 Work of the year under report: New work.	7 Remarks.
			28. Dera Ghazi Khan. *I.—Roads.*				
Dera Gházi Khan	4	Dera to Kot Chulta, (14 miles) ...	8 miles ...	6 miles ...	6 miles ...	...	Going over old work.
		Dera Gházi Khan to Dera Ismail Khan, 129 miles	126 „ ...	3 „ ...	3 „ ...	...	Gaps filled up.
		Dera to Sheru, 22 miles....	17 „ ...	5 „ ...	5 „ ...	...	Ditto; 2 miles failed.
		Dera to Marhattá (9 miles)	8 „ ...	1 mile ...	1 mile ...	...	Gaps filled up.
Rájanpur ...	...	Rájanpur to Hájipur, 20 miles	18 „	2 miles ...	2 miles	...	
		Rájanpur to Mithankot, 12 miles	2 „ ...	10 „	10 „ ...	...	Gaps filled up; 5 miles failed.
Jámpur ...	...	Jámpur to Rájanpur, (40 miles)	33 „ ...	7 „ ...	7 „ ...	...	Ditto, plants doing well except 2 miles, which failed.
		II.—Groves and Plantations.					
Dera Gházi Khan	4	Kotla Sikani Rakh ...	...	...	20 acres in 2 plots	...	Have been restocked.
		6 Nurseries ...	...	...	...	Some 6,000 plants	
		29. Bannu. *I.—Roads.*					
Bannu ...	8	Edwardes-abad to Bazár Ahmad Khan, (2 miles)	...	2 miles ...	2 miles, 269 trees	...	Partial success. 171 trees died owing to drought.
		Bazár Ahmad Khan to Fatima Khel (1 mile). ...	...	1 mile ...	1 mile, 144 trees	...	53 trees died.
		Edwardes-abad to Hawaid (11 miles)	5 miles ...	5 miles ...	6 miles, 350 trees	...	Partial success; 105 died.
		Edwardes-abad to Miriân, 8 miles	2 „ ...	4 „ ..	5 „ 680 trees	...	505 trees died owing to drought.
		Edwardes-abad to Lochi (6 miles)	4 „ ...	2 „ ...	2 „ 140 trees	...	82 died.

		Circular road (3 miles) ...	2 miles ...	1 mile ...	...	...	...	Nothing done.
Laki ...	6·9	Naurung to Laki (16 miles)	6 „ ...	10 miles ...	10 miles, 120 trees	...		Stony ground from the 7th to 13th miles; efforts without effect.
		Naurung to Landiwah (21 miles)	19 „ ...	2 „ ...	2 „ 140 trees	...		Several trees died.
Isa Khel ...	6·6	Isa Khel to Kala Bagh (27 miles)	21 „ ...	6 „ ...	3 „ ...	...		Sandy ground.
		Isa Khel to Dera Jhang (7 miles).	6 miles ...	1 mile ...	1 mile, 50 trees...	...		22 died.
		Isa Khel to Khaglanwala (3 miles)	2½ „ ...	½ „ ...	½ mile ...	...		Failure.
Miánwáli ...	6·9	Miánwáli to Musa Khel (30 miles)	29 „ ...	1 „ ...	1 mile, 801 trees	...		626 died owing to drought.
				II.—Groves and Plantations.				
Bannu ...		Public gardens ...	...	...	12 acres 2 roods	...		In a flourishing state.
Laki ...		Round Public buildings ...	...	...	230 trees ...	25.		
Isa Khel ...		Ditto ...	...	...	1,286 trees.			
Miánwáli ...		Ditto ...	...	...	* 342 trees ...	37 trees	...	* 22 trees died.
				30. PESHAWAR.				
				I.—Roads.				
Peshâwar ...	2·6	Urmar road (16 miles) ...	11 miles ...	5 miles ...	5 miles, 300 trees	...		200 failed.
		Phandoo road (2 miles) ...	...	2 „ ...	2 miles, 800 trees	...		400 „
		Guri Sirdar road (3 miles)	1 mile ...	2 „ ...	1 mile, 400 trees	...		200 „
		Edgha road (1 mile) ...	...	1 mile ...	1 mile, 400 trees	...		150 „
		Charperizia road (1½ mile)	...	1½ „ ...	1½ miles, 550 trees	...		250 „
		Jubba road (1½ mile) ...	...	1½ mile ...	1½ miles, 500 trees	...		250 „
		Tekhal road (3 miles) ...	...	3 miles ...	3 miles, 900 trees.	...		400 „
		Circular road (7 miles) ...	...	7 „ ...	7 „ 1,100 trees	...		500 „
		Cattle market road (1 mile)	...	1 mile ...	1 mile, 300 trees	...		100 „
		Bara road (6 miles) ...	2 miles ...	4 miles ...	4 miles, 800 trees	...		250 „
		Bhano Mari road (1 mile)	...	1 mile ...	1 mile, 500 trees	...		250 „
		Nowthew road (1 mile) ...	...	1 „ ...	...	400 trees	...	150 „
Mardán ...	16·7	Mardán to Jolala (12 miles)	11 miles ...	1 „ ...	1 „ 212 trees			
		Do. to Dosura, 8 miles	5 miles ...	3 miles ...	3 miles, 586 trees			
		Do. to Dispensary, ½ mile	...	...	½ mile, 233 „			
		Do. to Ruslakai 5 miles	...	...	5 miles, 1,889 „			
		Do. to Hoti 1½ mile	...	...	1½ „ 327 „			
		Do. to Circular road (1 mile)	...	...	1 mile, 123 „			
		Do. to Hashtnagar (1½ mile)	..	...	1½ miles 390 „			

Arboriculture Statement of the Punjab Districts for the year 1879-80—concluded.

Tahsíl.	1	2	3	4	5	6	7
	Rain-fall in inches.	Locality or name of road.	No. of miles still unplanted or planted and failed altogether.	Work of previous year which still requires completion.	Work of the year under report. Going over or completing old work.	New work.	Remarks.
			30. Peshawar—*concluded.*				
Utman Bolak ...	12·7	Lahore to Jahangera (10 miles)	2 miles ...	8 miles ...	8 miles, 2,200 trees	...	800 failed ; 900 partial success ; 500 successful.
Hashtnagar ...	3·6	Agra to Abazai (18 miles)	9 „ ...	9 „ ...	9 „ 400 „	...	30 failed.
		Tahsíl to Murdan (8 „)	7 „ ...	1 mile ...	1 mile 100 „	...	10 „
		Nissutta to Nowshera (7 „)	3 „ ...	4 miles ...	4 miles 247 „	...	20 „
		Do. to Dasura (9 „)	8 „ ...	1 mile ...	1 mile 170 „	...	20 „
Doaba Daudzai...	5·8	Fattu to Dabondi (9 „)	...	...	560 trees planted	...	20 „
		Fattu to Agra (6 „)	...	...	568 „ „ ...	...	18 „
		Darbungi to Fair Site (5 „)	1 mile ...	4 miles ...	250 „ „ ...	...	5 „
		Budni to Chukri Muti (10 miles)	2 miles ...	8 „ ...	729 „ „ ...	...	9 „
		Nagoman Ferry to Sarik (7 miles)	2 „ ...	5 „ ...	847 „ „ ...	...	7 „
		Nagoman Ferry to Aleozai (10 miles)	2 „ ...	8 „ ...	468 „ „ ...	...	8 „
		Khazana to Muttna (6 miles)	2 „ ...	4 „ ...	490 „ „ ...	...	5 „
		Nagoman to Kángra (4 miles)	...	...	270 „ „ ...	...	
		Nagoman to Michni (10 miles)	7 miles ...	3 miles ...	110 „ „ ...	...	10 „

			II.—Groves and Plantations.				
Naushahra ...	11·6	Taroo encamping ground	...	...	230 trees planted	...	20 failed.
		Naushahra „ ...	...	...	288 „ „ ...	...	38 „
		Akara „ ...	...	...	268 „ „ ...	...	48 „
		Kádirabad „ ...	...	...	329 „ „ ...	...	9 „
			31. HAZARA. *I.—Roads.*				
Hazárá ...	35	...	...	...	...		
Abbott-abad ...	35·7	Length of road undertaken (11 miles)	4 miles ...	7 miles ...	7 miles ...	...	530 trees planted with fair success—watering done by Bhistis.
Haripur ...	26·7	Ditto (18 „)	11 „ ...	7 „ ...	7 „ ...	...	1,309 ditto ditto ditto.
Mansahra ...	32·4	Ditto (12 „)	3 „ ...	9 „ ...	2 „ ...	...	165 tress planted with small success.
			II.—Groves and Plantations.				
Abbott-abad ...	...	Grass preserve (309 acres)	...	...	...	12 acres ...	4,000 fir trees planted ; a large number died from drought.
		Civil station ...	...	...	4 acres ...	...	Variety of forest trees planted.
		Station garden ...	...	...	½ acre ...	...	150 fruit trees.
Haripur ...	...	Municipality Limits ...	...	...	3 acres ...	...	Variety of forest trees planted.
	...	Rakh Manakrái ...	...	...	...	...	Sissu, tun and tehtar planted.
	...	Municipality gardens ...	...	...	43 acres ...	2 acres ...	Planted with fruit trees.
Naushahra ...	...	Tahsíl and Dák bungalow compounds	...	...	1 acre ...	...	Variety of forest trees planted.
			32. KOHAT. *No Arboriculture.*				
Kohát ...	10	...	...	...	...	...	

PROGRESS REPORT

OF

DISTRICT AND CANAL ARBORICULTURE

IN THE

PUNJAB

FOR

1880-81,

COMPILED BY

W. SCHLICH, Esq., Ph.D.,

CONSERVATOR OF FORESTS;

WITH A REVIEW BY H. H. THE LIEUTENANT-GOVERNOR OF THE PUNJAB.

Lahore:

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1881.

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No. 602 C. L., dated Simla, 1st October 1881.

From—Dr. W. SCHLICH, Conservator of Forests, Punjab,

To—The Secretary to Government, Punjab.

I HAVE the honor to submit herewith the report on "District and Canal Arboriculture for the year 1880-81." The report was due to Government on the 1st September, but, as already reported in my letter No. 379 C. L., dated 17th August, on the latter date the reports of the Umballa, Jullundur, Rawalpindi and Derajat Divisions had not been received; and as I started on the 19th August for Dehra Dun, the compilation of the report had to stand over until my return to the Punjab. Even now the reports of the Kangra and Dera Ismail Khan districts have not been received, and they have, therefore, been omitted.

2. The Government in their letter No. 119 F., dated 16th March 1881, issued orders how the district reports should be drawn up. The statements of avenues and groves submitted this year seem to be in most cases fairly correct; but the descriptive part of the reports is in many instances capable of improvement. In some cases the text has been carefully compiled, but in many other cases it was difficult to make out the meaning. In one or two cases the reports were drawn up in such a careless manner (evidently by some subordinate in the office), that it was impossible to make anything of it. I regret having to draw attention to this fact; but I am obliged to do so if the Arboricultural Report is not to become a farce.

3. In some cases the avenues not yet commenced have been enumerated in the tabular statement, but in others this has not been done; hence they have generally been omitted. I should suggest that in next year's report a complete list of all avenues which it is desirable to plant by degrees be given. If this is done in every district, and if the statement is prepared either by the Deputy Commissioner himself, or at any rate by a responsible assistant (and not by a subordinate in the office), Government will be able to arrive at a correct conclusion as to what portion of the work has actually been done and what remains to be taken in hand.

4. District Arboriculture generally comprises three classes of work, namely :—

(1) Avenues,

(2) Nurseries and groves; and

(3) Station gardens.

Of these the planting of avenues is of course the most important. The subjoined table exhibits the work done so far, and the financial results of the year:—

Division.	District.	Length of Avenues planted in Miles.			Financial Results in Rupees.				Remarks.
		In former years.	During the year 1880-81.	Total.	Receipts.	Charges.	Surplus.	Deficit.	
					Rs.	Rs.	Rs.	Rs.	
Delhi ...	Delhi ...	113	24	137	4,538	7,554	...	3,016	
	Gurgaon ...	55	17	72	403	3,039	...	2,692	
	Karnal ...	39	8	47	121	5,377	...	5,256	
Hissar ...	Hissar ...	58	...	58	131	4,589	...	4,458	
	Rohtak ...	71	8	79	133	3,820	...	3,687	
	Sirsa ...	95	...	95	161	642	...	481	
Umballa ...	Umballa ...	140	7	147	1,840	2,925	...	1,085	
	Ludhiana ...	92	2	94	2,296	4,324	...	2,028	
	Simla ...	...	...	...	...	...	...	...	No district arboriculture.
Jullundur ...	Jullundur ...	160	3	163	3,082	1,516	1,566	...	
	Hoshiarpur ...	256	59	315	8,581	6,024	2,557	...	
	Kangra ...	...	...	...	...	...	...	...	Report not received.
Amritsar ...	Amritsar ...	93	...	93	900	7,160	...	6,260	
	Gurdaspur ...	435	...	435	1,000	5,182	...	4,182	
	Sialkot ...	277	3	280	2,314	2,418	...	104	
Lahore ...	Lahore ...	49	21	70	72	2,320	...	2,248	
	Ferozepore ...	331	51	382	310	5,384	...	5,074	
	Gujranwala ...	82	19	101	458	4,505	...	4,047	
Rawalpindi ...	Rawalpindi ...	382	60	442	40	293	...	253	
	Jhelum ...	103	8	111	913	4,197	...	3,284	
	Gujrat ...	21	7	28	...	559	...	559	
	Shahpur ...	...	4	4	385	2,797	...	2,412	
Mooltan ...	Mooltan ...	111	2	113	...	2,542	...	2,542	
	Jhang ...	28	4	32	160	3,574	...	3,414	
	Montgomery ...	9	1	10	...	1,186	...	1,186	
	Muzaffargarh ...	33	10	43	390	7,305	...	6,915	
Derajat ...	Dera Ismail Khan...	...	...	...	...	...	...	...	Report not received.
	Dera Ghazi Khan...	46	7	53	...	4,497	...	4,497	
	Bannu ...	36	1	37	42	1,202	...	1,160	
Peshawar ...	Peshawar ...	97	35	132	57	8,193	...	8,136	
	Hazara ...	23	9	32	1,548	2,515	...	967	
	Kohat ...	4	5	9	...	...	...	...	
	Total ...	3,239	375	3,614	29,875	1,05,695	4,123	75,820	

5. The above table shows that 3,239 miles of avenues have been planted in former years and 375 miles during the year 1880-81. Besides these extensions, however, large numbers of trees have been planted in the old avenues to replace trees that have died or fallen. On an average 12 miles of new avenues have been planted per district, which seems a small amount.

6. The weather during the year under review was on the whole not favorable. There are complaints from most districts that the rainfall was either below the average or unfavorably distributed; the result being that a large number of young trees planted out succumbed for want of moisture.

7. This year we have for the first time a fairly correct financial statement before us. It will be observed that the receipts amounted to Rs. 29,875 against an expenditure of Rs. 1,05,695. These figures do not include the return of the Kangra and Dera Ismail Khan districts. Only in two districts, Jullundur and Hoshiarpur, has a surplus been established. It is not clear

from the Jullundur report what portion of the receipts is derived from the sale of grass and how much from the sale of trees; but in Hoshiarpur by far the greater part of the receipts is due to the sale of wood. This proves that care bestowed upon arboriculture in the Punjab may, besides securing essential benefits to the people, be accompanied by actual profit. Unfortunately a somewhat large proportion of the outlay is as yet in many districts bestowed upon favorite station gardens. To keep up such gardens is quite right, but care must be taken that real district arboriculture does not suffer by it.

8. As regards canal arboriculture a table similar to that given in paragraph 4 is appended :—

Division.	Length of Avenues planted in Miles.			Financial Results in Rupees.				Avenues still to be planted in miles.
	In former years.	During the year 1880-81.	Total.	Receipts.	Charges.	Surplus.	Deficit.	
				Rs.	Rs.	Rs.	Rs.	
Bari Doab, 1st Division ...	160	49	209	5,055	13,030	...	7,975	68
Ditto 2nd ditto ...	155	...	155	13,083	6,429	6,654	...	...
Upper Sutlej Inundation Canals,	301	...	301	1,942	374	1,568	...	...
Lower Sutlej and Chenab Inundation Canals ...	580	...	580	5,368	1,508	3,860	...	...
Indus Canals ...	98	12	110	2,128	2,757	...	629	257
Sirhind Canal Main Line Division	...	...	...	...	..	...	...	...
Ditto 3rd Division ...	128	6	134	...	846	...	846	70
Ditto 4th ditto ...	8	...	8	...	333	...	333	37
Ditto 5th ditto ...	...	...	...	...	...	...	...	...
Western Jumna Canal, Karnal Division	131	...	131	1,732	874	858	...	79
Ditto Hansi Division ...	358	...	358	6,177	2,552	3,625	...	...
Ditto Delhi ditto ...	11	...	1	4,305	526	3,779	..	70
Ditto New Delhi Branch	272	7	279	...	303	...	303	75
Muzaffargarh Canal Division	...	...	...	...	...	...	...	...
Swat Canal Division ...	...	...	...	...	...	...	...	...
Total ...	2,202	74	2,276	39,790	29,532	10,258	...	656

In addition to the avenues, a considerable area of groves and patches have been sown with seed. The extension of 74 miles of avenues appear moderate, considering that 656 miles remain to be planted. The financial results differ very little from those of the year 1879-80.

I have the honor to be,

Sir,

Your most obedient Servant,

W. SCHLICH,

Conservator of Forests, Punjab.

I.—DISTRICT ARBORICULTURE.

1.—DELHI DISTRICT.

A.—Deputy Commissioner's report.

General Remarks.—The rainfall of the district, though somewhat late, was good, and above the average. In the Delhi and Sonepat tahsils the young plants, on some of the roads, suffered to some extent from the hot winds in summer and the frost in winter, and in the nursery near Tuglakabad, in the Ballabgarh tahsil, more than three-fourths of the plants were destroyed by wild rats. The year, otherwise, was not characterized by any event specially affecting arboriculture.

Description of Work.—The following is a record of the works done during the year :—

Tahsil.	Road or locality.	Number of trees planted during the year.	Number of trees planted successfully.	Percentage of trees planted successfully.
	I.—Avenues.			
Delhi ...	Delhi-Najafgarh Road ...	1,000	960	96
	Nangloi-Najafgarh Road ...	Kikar sown in trenches.	350	...
	Chandni Chouk Road ...	These are old avenues; vacant spaces were replanted.		
	Circular Road ...			
	Esplanade Road ...			
	Lothain Road ...			
	Hamilton Road ...			
	Morigate Road ...			
	Boulevard Road ...			
	Under Hill Road ...			
	Rajpur Road ...			
	Ridge Road ...			
	Alipur Road ...			
	Roshanara Road ...			
	Queen's Road ...			
	The Park ...	80	70	90
Sonepat ...	Sonepat-Bahalgarh Road ...	800	700	87
	Thana Kalan and Baghpat Road ...	450	350	77
	Road from Delhi to Baghpat ...	200	150	75
Ballabgarh ...	Road from Badarpur to Tuglakabad ...	845	830	98
	Road from Tuglakabad to Mahrauli ...	Kikar sown in trenches.	2,688	...
	II.—Groves, Nurseries and Plantations			
Delhi ...	Nursery at Mubarik Bagh ...	3,000	2,150	71
	Ditto at Tatarpur ...	800	730	87
	Ditto at Alipur ...	100	65	65
	Mahaldar Khan, Police outpost ...	14	12	85
	Makbara Paik Ditto ...	25	10	40
	Nangli „ Ditto ...	50	37	74
	Nathupur Ditto ...	83	72	86
	Sanghola Ditto ...	160	121	75
	Sikri Ditto ...	29	22	78
	Tihar Ditto ...	60	53	88
	Sarai Sitaram Ditto ...	25	20	77
	Mundka Ditto ...	37	28	75
Sonepat ...	Nursery in 1st mile of road between Sonepat and Bahalgarh ...	4,000	3,000	75
	Nursery in 3rd mile of road between Sonepat and Bahalgarh ...	4,400	4,000	90
	Do. at Rai ...	6,500	6,000	92
	Police outpost at Kimashpur ...	81	69	85
	Ditto at Rai ...	74	73	100
	Ditto at Murtal ...	160	115	72
	Ditto at Bahalgarh ...	7	7	100
	Ditto at Larsauli ...	15	8	53
	Ditto at Garhi Kalla ...	92	78	84
	Ditto at Barhi Kalan ..	66	60	92
Ballabgarh ...	Nursery near the staging bungalow at Kutab ...	1,100	1,000	90
	Police outpost on Faridabad and Mathra Road,	500	450	90
	Ditto at Majhaoli ...	127	127	100
	Ditto at Pulbudhia ...	27	27	100
	Ditto at Talab Kishandas ...	62	60	96
	Ditto at Atta Bar ...	55	54	100
	Ditto at Chaesa ...	380	350	92

The rains in some parts of the district did not set in till the end of July, and although additional bhistis were entertained, the trees previously planted on the roads noted in the margin, and in the nurseries at Tatarpur and Tuglakabad, suffered to some extent. With these exceptions the avenues and groves were in fair condition at the beginning of the year.

Azadpur-Baghpat Road.
Sonepat-Bhatgaon Road.
Faridabad-Majhaoli Road.
Rohat and Thana Khurd Road.

Early in May 1880, proposals were called for from the tahsildars and District Superintendents of Police as to the nature and extent of the tree-planting to be undertaken during the year. It was afterwards decided to plant the roads noted in the margin with kikar, nim, tali and other trees suited to the soil of the district. Accordingly, planting operations were commenced early in August 1880, young trees being obtained from the nurseries at Mubarik Bagh, Tatarpur and Rai. Tali and kikar seed was sown in trenches on the sides of the Nangloi-Najafgarh road and of the road between Tuglakabad and Mahrauli. Fresh seed was also sown in the nursery at Mubarik Bagh near Delhi. Four new nurseries* were also established with success during the year for the supply of young trees for roadsides in their neighbourhood, besides planting compounds of 22 police outposts and thanas, a detail of which is given in the return.

1. Delhi-Najafgarh Road.
2. Sonepat-Bahalgarh Road.
3. Thana Kalan and Baghpat Road.
4. Road from Delhi to Baghpat (Sonepat tahsil).
5. Badarpur-Tuglakabad Road.

* 1. Alipur.
2. In 1st mile of Sonepat-Bahalgarh Road.
3. In 3rd mile of Sonepat-Bahalgarh Road.
4. At Rai.

No work was done in the Delhi-Bela plantation during the year, as it is already overgrown with trees, but a portion of the plantation was cleared of undergrowth at the suggestion of the Officer Commanding the Station on the report of a Committee of medical officers. An account of arboricultural operations within the Delhi municipal limits is given in detail in the report furnished by the Secretary of the Municipality, a copy of which is appended. The Tilauri plantation at Ballabgarh is said to contain about 110,000 well-grown trees, chiefly kikar, willow and tali. No new trees were planted during the year, as the rakh is leased for grazing purposes.

Of the nurseries in this district that at Mubarik Bagh near Delhi is the best, and it produces a large number of trees every year for distribution. The other nurseries are small and established only for local purposes; they do not require any notice. The work done in previous years is shown in detail in the tabular statement accompanying the report.

Establishment.—The establishment employed for the different works in this district costs Rs. 5,747 during the year, and it consists of the following staff:—

		Rs.
4.	Foresters and jemadars, costing	731
7.	Peons	420
2.	Chaukidars	60
1.	Sweeper	48
29.	Malis	1,337
9.	Beldars	185
6.	Coolies	339
42.	Bhistis and pakhalis	2,627
	Total cost ...	5,747

A permanent staff of coolies, each on Rs. 5 per mensem, was kept up during the year to look after the roads between Delhi and Najafgarh and between Badarpur-Tuglakabad. These men, besides executing petty repairs to the roads, are also responsible for the general care and preservation of roadside trees. A large establishment is maintained for the preservation and improvement of the numerous roadside avenues within municipal limits.

Each tahsildar is responsible for arboricultural operations within his tahsil. He is assisted by the road overseers, zaildars and the members of the District Committee. His work is also inspected by the District Officers during their tours of inspection.

Financial Results—

Receipts—

	Rs.	
By sale of trees	2,405	
„ „ of grass and grazing	2,088	
„ miscellaneous items	45	
		4,538

Expenditure—

Establishments	5,747	
Planting operations	760	
Purchase of seed	30	
Clearing the Delhi-Bela of undergrowth ...	330	
Fencing	521	
Subscription to the Agri-Horticultural Society for 1880-81	120	
Miscellaneous items	46	
		7,554
Deficit		3,016

B.—Delhi Municipal Secretary's report.

The sum expended by the Committee towards the maintenance of trees amounted to Rs. 3,891-3-7, against Rs. 3,800 expended in the previous year, of which the following are the details :—

		Rs.	A.	P.
1.	Salaries of establishment	3,370	2	4
2.	Construction of brick enclosures	385	5	10
3.	Ditto and repairs to jafri enclosures ...	135	11	5
	Total	3,891	3	7

Where necessary trees have been planted along the sides of the roads in the civil station and in the city, chiefly tali, pipal, nim, mango and mulberry.

Very little remains to be done in the way of planting in the civil station. Every road is lined with rows of trees uniformly planted, which gives the roads a particularly neat appearance. An establishment consisting of malis and bhistis is specially employed for looking after the trees and young plants. The only addition effected in the civil station during the year has been the planting of a number of jaman, tali and bamboo plants on the ground known as the "Park," formerly "Billing's estate," which was hitherto in a very neglected and uneared for state. But lately this ground has been levelled and improved and planted with trees. It was made over to the Committee in 1877 on condition that it would be levelled, cleaned and planted, but hitherto this was not practicable, as the ground was covered with old buildings and bricks, the property of the Public Works Department. These have lately been removed, and the work of improving the ground has commenced.

In the city also many similar improvements have been effected in arboriculture. The whole length of the Esplanade road from Faiz Bazar to the Chandni Chouk was replanted with trees throughout, and brick enclosures of a new pattern were constructed round the young plants to protect them from being injured.

This road has been many times planted and replanted, but the young trees have never been allowed to grow, the cause being that this part of the city is infested with cattle belonging to "ghosis" which destroy the plants when being taken out and brought back from grazing. Many attempts have been made on the part of the Committee to prevent the mischief, but it has been found very difficult, and even with the assistance of the police it is almost impossible to interfere, as the cattle that pass out of the city of a morning are innumerable, hence many of the roadside trees similarly planted have suffered, until it became absolutely necessary to put up circular mud walls and brick enclosures. These are strong and substantial and cannot easily be tossed over, while this is generally done with the jafri enclosures.

The trees planted on the Ridge Road mentioned in the report submitted last year are seemingly improving. A number of small plants were put down along the road from Hindu Rao's house to the Flag Staff tower, and these operations have been successful

All the roads within municipal limits were generally well attended to and supervised in respect to tree-planting. Plants that happened to wither up or that were destroyed, were at once replaced by others procured from the public gardens. Two hundred and seventy trees were planted on the Circular Road from the Cashmeri to the Delhi Gate.

As stated in last year's report the Committee have decided upon adopting one uniform pattern of plant enclosure for the future, namely, brick enclosures. They vary in shape, some are circular and others octagonal, and they are certainly an improvement on the jafri ones. Five hundred and fifty-three new brick enclosures have been constructed and 100 old ones repaired. They can easily be removed from place to place at little or no cost, and on the whole when once put up on all the roads there will be a saving effected under this head.

During the year under report the Bela plantation has been the subject of some correspondence between the Deputy Commissioner and Conservator of Forests, emanating from the opinions expressed by a committee consisting of medical officers, who after inspection pronounced the plantation as being most injurious to the health of the troops located in the fort, and to the inhabitants of the city. They stated that many parts of the Bela were covered with a dense low jungle, and they pointed out that it was very necessary in a sanitary point of view to have this removed at once.

A small portion of the Bela contiguous to the city wall was in a manner cleared, but owing to the rains having set in the work had to be discontinued.

No further action took place till the beginning of the year when the Conservator of Forests visited Delhi in order to inspect the plantation. On receipt of a copy of his report to Government, which was laid before the Municipal Committee, action was taken in accordance with the suggestions therein contained, by cutting away the undergrowth, and the work is still in progress.

Though this work was commenced after the end of the year to which this report refers, it will be useful to add a few words as regards the progress effected during the last two months.

The Bela is divided into three blocks, *viz.*—

	Acres	Roods	Poles.
Chandrawal, approximate area	122	2	22
Andhauli ditto	348	2	19
Kaithwara ditto	31	1	38
Total area of the Bela plantation is	510	2	39

The clearing was commenced from the extreme corner of that portion known as Kaithwara which is close to the Selimgarh bridge. The undergrowth, consisting of sarkanda and long grass, was completely rooted up, stacked some distance from the trees and burnt. Large quantities of "jhao" were sold, as also heaps of dry branches of trees. The undergrowth has been so thoroughly cleared away that a clear view of the plantantion ground is obtainable from the city wall to the banks of the river, whereas formerly it was so dense that people avoided going anywhere near it.

It is intended to carry out the suggestion of Dr. Schlich in leasing out suitable places in the Bela for cultivating purposes, and this will be done as soon as the present work is completed. For the present the "ghosis" are permitted to graze their cattle in the plantation on payment of 2 annas for each buffalo and one anna for each cow. Whilst the cattle keep down the undergrowth the Committee are at the same time deriving a good income from grazing fees and from the sale of grass.

2.—GURGAON DISTRICT.

General Remarks.—The rainfall generally throughout the district was late and below the average. In tahsils Gurgaon and Nuh many trees died in May and June. In tahsils Firozpur and Palwal many trees were destroyed by high winds and dust storms.

The year otherwise has not been characterized by any special events. Gurgaon and Nuh tahsils shew the best work and results. In the Gurgaon tahsil, notwithstanding that very young trees were planted out, constant watering and attention will create good avenues, particularly on the roads to the Railway station and to Bahadargarh.

Description of Work.—The following is a record of work done :—

Tahsil.	Road or Nursery.	Trees planted.	Successful.	Percentage successful.
Gurgaon ...	Gurgaon-Sohna ...	700	350	50
	Road to Railway station ...	3,662	3,602	98
	Bahadargarh ...	1,000	955	95
	Kutab ...	1,562	1,368	86
	Sohna-Palwal ...	650	550	84
	Bahora-Tauru ...	300	150	50
	Farukhnagar to Railway ...	59	59	100
	Civil Station Roads ...	1,695	1,615	94
	Civil Station Nursery ...	Trees	planted out. ...	...
	Bhundsi Nursery ...	Nothi	ng done. ...	...
	Station Garden Nursery ...	Trees	planted out. ...	...
	Jharsabund ...	All	old trees. ...	...
Nuh ...	Nuh to Firozpur ...	470	470	100
	Nuh to Palwal ...	Nothi	ng done.	...
	Nuh to Rewari ...	Kikar	sown broadcast.	...
	Tauru to Bahora ...	1,696	1,696	100
	Hattin to Palwal ...	466	347	69
	Tauru Nursery ...	10,300	Planted out on roads.	...
	Nuh Nursery ...	150	Ditto	Ditto
Palwal ...	Palwal to Sohna ...	340	269	80
	Palwal to Nuh ...	111		...
	Palwal to Hattin ...	486	486	100
	Palwal Nursery ...	2,540	Planted out on roads.	...
	Nursery at 5th mile ..	700	500	71
	Do. at 2nd mile ...	300	200	66
Firozpur ...	Firozpur to Nuh ...	982	932	95
	Do. to Alwar ...	750	710	94
	Jhirka Pass ...	135	125	93
	Firozpur Nursery ...	2,223	Planted out on roads.	...
Rewari ...	Circular Road ...	186	186	100
	City to Railway ...	229	229	100

The following wells were sunk:—

On Railway Station Road, Gurgaon	... 1 well.
On Kutab ,,	... 3 wells.
On Sohna to Palwal ,,	... 2 new wells.
On Sohna to Gurgaon ,,	... 1 well.
On Bahadargarh ,,	... 3 wells, 1 just sunk.
On Bhundsi Nursery ,,	... 1 just sunk.

No farash stumps were planted during the rains. Round new trees thaoulas were in many instances erected for their protection, *e. g.*, on Kutab and Farakhnagar Railway station roads. All young trees were protected from the cold by the ordinary method of surrounding them with straw.

Nothing has been done in the way of tree-planting; in the Rewari tahsil probably attempts would not be very successful there, except perhaps the planting of farash and kikar, *e. g.*, a very good specimen of kikar broadcast sowing near the Rewari Railway Station.

A young man, Sayad Hassan, was sent to learn something of arboriculture at Changa Manga.

Establishment.—The following establishment has been kept up;—

	Rs.	
1 darogah, costing ...	105	
30 malis ...	1,168	
27 bhistis ...	1,410	
Total Rs. ...	2,683	per annum.

This establishment is not a constant one. In May and June additional bhistis are employed owing to drought, and in the rains all bhistis not required are dispensed with for the time. The operations are supervised by the tahsildars, zaildars and municipal committees.

Financial results.—

Receipts—

	Rs.	A.	P.	Rs.	A.	P.
From sale of grass ...	221	4	0			
,, ,, of trees ...	181	7	0			
				402	11	0
Charges—						
Establishments ...	2,683	7	8			
Cost of training a man at Changa Manga ...	30	6	0			
Protection of trees ...	41	10	3			
Planting trees ...	91	0	2			
Making and cleaning katcha wells ...	13	12	0			
Making thaoulas ...	229	2	0			
Reward ...	5	0	0			
Tools ...	0	11	0	3,095	1	1
Deficit ...				2,692	6	1

3.—KARNAL DISTRICT.

General Remarks.—The past year was not very favorable although the rains were abundant, in consequence of the long break in the month of August during which watering is not supposed to be generally necessary.

The best method of raising trees in this district appears to be to provide large mud fences with a slope in the wall to enable them to stand several years' rains. Much unprofitable work has been done one time or another by using thorn fences instead of mud fences. They are cheaper to construct and look well, but instead of lasting for three or four years, as they require to do, they have difficulty in lasting so many months, because the whiteants feed on them, and every other native who passes supplies himself from them with a little fuel to cook his food. In course of a little time the plant is exposed and a passing goat or bullock snips off the top and completely destroys the progress of months or even of a whole year. After these operations have been repeated several times, the plant, if it ever succeeds in raising its head above grazing animals, can only be a stunted scrubby tree and painful to look at. It can be observed in this district that any trees that have succeeded, have still the traces of a good mud fence around them. In future they will be constructed before the tree is planted.

Most roadsides, where arboriculture is at all easy, are infested with kikar and other trees of spontaneous growth. There is no objection to a kikar tree in its proper place. It is a very useful tree and gives a little shade, but it is very objectionable where it is desirable to have trees of a better sort. Its vitality is such that no other trees can grow in its neighbourhood; but, on the other hand, it is very shortlived, and after it has reached a certain stage, every other storm carries away a fresh branch, and it becomes useless for shade and a wretched looking object. Owing to its existence about Karnal, there is not a single good avenue in

Karnal or its neighbourhood. All along the Grand Trunk Road where it abounds, the Public Works Department are quite hopelessly endeavouring to raise avenues of flowering trees, while they succeed excellently where the ground is clear. The kikar ought to have the field to itself if an avenue of it can be considered sufficient, or it should be remorselessly cleared out to prevent waste of labour.

Description of Work.—The work done during the year has been to plant out 3,440 trees of the better sorts, tali, pipal and jaman; to continue irrigation on 7,005 trees, of which 862 had to be replanted; to fill up blanks planted in former years; to make experiments in planting out tamarisk at a cheap rate, and to maintain three nurseries for young trees at Karnal, Kaithal and Panipat.

Karnal towards Kaithal Road.—There are altogether 2,128 trees planted on this road over 15½ miles of it, and mostly on one side only; but really allowing 30 feet between each tree, only 6 miles should be considered as planted, and this length only has now been entered. At the beginning of the year the trees were in fair condition, but work is carried on under great difficulties, as water is very distant and the country is very arid; 431 blanks were filled up during the year, but orders have been issued not to plant fresh trees for the present, and to begin again at a future time with the assistance of water from the new canal. An experiment was made in attempting to raise tamarisk trees by planting out slips during the rains, but it failed, as a similar experiment did at Kaithal owing to the long break in August.

Karnal towards Meerut Road.—Three miles of this road are planted with trees that have nearly reached maturity, but there are blanks. A bhisti was maintained attempting to raise trees on these blanks which are due chiefly to the badness of the soil. The trees are not in a thriving condition for the most part, and it seems advisable to give up the attempt of raising more trees.

Karnal and Saharanpur Road.—The two miles of this road have considerable blanks, on which a bhisti is employed endeavouring to fill them up. The rest of the trees are beyond the want of attention. The case of this road is very similar to that of the Karnal and Meerut Road just referred to.

Karnal and Hansi Road.—Trees are planted over three miles two furlongs of road, but there are wide blanks due to reh soil, on which the growing of trees is almost hopeless. These blanks reduce the length planted to 1 mile 6 furlongs. Plants are put in and tended. They make some progress and then most of them die, while a few only succeed. There is no saying whether a tree will succeed until it has reached a height of 6 or 7 feet. Operations on this road, too, had better be abandoned until canal water becomes available, which will soon be the case.

Karnal and Jagadhri Road.—Trees are planted on 12 miles 4 furlongs of this road, but the blanks are so extensive that only 6 miles have been entered as planted. Two bhistis are employed in watering 300 trees, the whole number planted out being 1,560. The work is unsatisfactory, those parts of the road having failed which are unsuited, owing to reh or some other cause. The trees that shew signs of being likely to reach maturity only will be attended to and the rest of the road will be abandoned until operations can be undertaken on its entire length.

Karnal towards Firozpur Road.—During the year 673 trees have been planted out on 1 mile of this road. They have been well fenced and were very thriving at the end of the year.

Indri to Thanesar.—The trees on this road have reached maturity and form a good avenue on 2 miles with not many blanks. There are no operations in progress on it.

Karnal Station Roads.—These roads contain 1,748 trees, out of which 646 were planted out within the year. Besides those newly planted out, 216 are receiving maintenance. All the trees are in a thriving condition, and are well protected; 1,500 more trees require to be planted out to make the avenues complete, and arrangements for doing this have been made in the current year.

Kaithal and Karnal Road.—The trees on this road have been well attended to throughout the year, but they are not as a rule thriving, the climate and soil being adverse to them. 514 trees are receiving maintenance; very few trees have passed this stage. A sum of Rs. 50 was spent on attempting to raise tamarisk by merely planting slips in the rains. The experiment failed in consequence of the long break in August.

Kaithal and Jind Road.—There are 1,100 trees on the three miles of this road planted out. They have been well attended to and have made fair progress during the year, but growing trees in this quarter is a very uphill task.

Deobund and Asandh Road.—There are planted 1¼ miles, *viz*: 2 pieces of road near the Asandh and Rajaund thanas, containing 401 trees receiving maintenance. They have made satisfactory progress.

Panipat and Sanauli Road.—The whole of this road save one mile is now planted out with 2,912 trees, of which 1,580 were planted during the year. The trees were in a very satisfactory condition both in the beginning and at the end of the year.

Panipat to Barsat.—Half a mile of this road is planted with 146 trees, which no longer require maintenance.

Grand Trunk Road to Panipat Sessions House.—This road is completely planted out with tali trees, 723 in all, of which 370 were planted during the year. Two hundred and fifty of the trees no longer require maintenance. The trees are all in a very thriving condition, being well attended to and protected with mud fences.

Panipat to Rohtak.—Half mile of this road is planted out with 200 trees which require no maintenance.

Panipat Bungalow to Karnal Road.—This road is now completely planted out with 952 trees, of which 200 were planted out within the year. They are all thriving and have made good progress within the year, being all provided with mud fences.

Tahsil Panipat to City Road.—There are 120 trees on this road, which is completely planted out. They do not require maintenance.

The nursery at Karnal contains 4,000 seedlings and 178 large fruit trees. It has supplied 2,628 seedlings for planting out during the year, of which 600 were given to the Public Works Department.

The encamping-ground at Karnal contains 635 trees, of which 45 are receiving maintenance Many of the large trees are very good.

The grove and encamping-ground at Gharaunda contain together 252 trees. Nothing is being done there, as the trees no longer require maintenance.

The Batana encamping-ground contains 44 trees which have come to maturity. Nothing was done during the year.

The Dâk Bungalow compound contains 28 trees, of which 14 are receiving maintenance, and are in good condition.

The Police Lines contains 122 trees, all of which have reached maturity.

The Kutcherry compound contains 100 trees, of which 23 are receiving maintenance and have been in a thriving condition throughout the year.

The nursery at Panipat contains 1,000 seedlings, and it has supplied 2,150 for planting out during the year.

The encamping-ground at Panipat contains 53 trees, which have received no maintenance. More trees are desirable, but the ground is barren and ill-suited for raising them.

The encamping-ground at Sanbhalkha contains 150 trees, which do not require maintenance.

The nursery at Kaithal contains 1,500 plants, and it has supplied 80 for planting out during the year.

There are 98 trees on Bidkidar Tank channel, which do not require maintenance.

Establishment.—The following establishment has been entertained during the year :—

	Rs.	
4 mates, costing	281	per annum.
10 malis	594	,,
76 pakhalis and bhistis	2,798	,,
		,,
Total	3,673	,,

The supervision has been effected by the tahsil establishments, the mates, the gardeners of the Karnal station garden, and the Deputy Commissioner's head clerk.

Financial Results.—There is little income to be expected as the trees have not been planted closer along the roads than they are intended to stand ultimately. The only income, therefore, is from trees blown down by the wind and the like. The financial results are as follows :—

	Rs. A. P.	Rs. A. P.
Receipts.—		
By sale of trees	77 5 3	
,, ,, of fruits, &c.	43 9 9	
		120 15 0
Charges.—		
Establishments	3,673 4 4	
Planting operations	312 0 0	
Fencing	827 0 0	
Subscription to Agri-Horticultural Society ...	240 0 0	
Miscellaneous charges	324 10 2	
		5,376 14 6
Deficit ...		5,255 15 6

4.—HISSAR DISTRICT.

General Remarks.—This district is a particularly unfavorable one for arboricultural operations owing to the arid nature of the soil and the scarcity of water. It has been found impossible to secure good avenues without bringing a canal cutting along both sides of the roads which it is proposed to plant. For these reasons the progress made in this direction has necessarily been slow. There has been no abnormal circumstances affecting arboriculture during the year.

The species of trees which have been planted with the greatest success are the tali, the kikar and farash. The tali, however, requires a regular and good supply of water for the first five years of its growth. The tun grows well along canal cuttings, but also requires a plentiful supply of water, and is not so hardy as the tali. The siriss appears to be a complete failure, all the surviving specimens being stunted.

The kikar grows best and is the most hardy where water is scarce, but it is wanting in density of foliage and consequently affords but little shade. The nim grows well with care, as also does the pipal; but both require abundance of water during the early steps of their growth.

Description of work.—The work done during the year under report has been principally confined to filling up gaps in avenues and renewing and restoring existing groves and plantations. This work may be detailed as follows :—

Hansi and Hissar (metalled road).—Ten miles of this road were planted in previous years. There were at the commencement of the year 2,271 trees; 67 were added during the year to replace those dead, and of these 57 were successful.

Old Hansi Road (katcha).—Eleven miles were planted in previous years. There were 810 trees existing at the commencement of the year; no additions were made.

Hissar-Bhiwani Road (katcha).—Two miles were planted in previous years. There were 194 trees existing at the commencement of the year; 50 new trees were planted during the past year, but all died for want of water.

Hissar-Barwala Road (katcha).—Seven miles were planted in previous years. There were 666 trees existing at the commencement of the year; 101 new trees were planted during the past year, but all died for want of water.

Hansi to Mahm (katcha).—One-and-a-half miles were planted in previous years. There were 1,950 trees existing at the commencement of the year; 291 new trees were added during the year under report, and of these 56 were successful.

Hansi to Hissar (metalled).—Two miles were planted in previous years. There were 200 trees existing at the commencement of the year; 91 were added during the year, and of these 50 were successful.

Hansi to Bhiwani (partly metalled).—Six miles were planted in previous years. There were 1,115 trees existing at the commencement of the year, 97 new trees were added during the year, and of those 43 were successful.

Hansi to Karnal (katcha).—One mile was planted in previous years. There were 135 trees existing at the commencement of the year, 60 new trees were planted during the past year, but all died for want of water.

Hansi-Barwala Road (katcha).—One mile was planted in previous years. There were 100 trees existing at the commencement of the year; 40 new trees were planted during the past year, but all died for want of water.

Hansi to Tosham Road (katcha).—One mile was planted in previous years. There were 200 trees existing at the commencement of the year; no additions were made.

Bhiwani-Hansi Road (partly metalled).—Half a mile was planted in previous years. There were 300 trees existing at the commencement of the year; 55 new trees were planted during the past year, but all died for want of water.

Road outside Putrani Gate (metalled).—This road was newly planted during the past year; 99 trees were put down, and all were successful.

Circular Road (katcha).—The entire length of this road was planted in previous years. Seven hundred and twenty-five trees existed at the commencement of the year; 750 trees were added during the year, and of these 650 were successful.

Fendall Bazar (metalled).—This street was newly planted during the past year; 126 trees were put down, and of these 118 succeeded.

Fatahabad-Hissar Road (partly metalled).—One mile was planted in previous years. There were 346 trees existing at the commencement of the year, 34 trees were added during the past year, and of these only 4 succeeded.

Fatahabad-Sirsa Road (*katcha*).—One mile was planted in previous years. There were 458 trees existing at the commencement of the year; 200 trees were added during the year, and of these 100 were successful.

Road from town to Delhi Road (*metalled*).—The whole length being 870 feet, was planted in previous years. There were 34 trees existing at the commencement of the year, 20 trees were added during the past year, and of these only 4 were successful.

Road from town to encamping-ground (*katcha*).—The entire road was planted in previous years. There were 515 trees existing at the commencement of the year, 200 new trees were planted during the past year, and of these only 100 succeeded.

Barwala to Hansi (*katcha*).—One-fourth mile was planted in previous years. There were 127 trees existing at the commencement of the year; 110 trees were added during the past year, and of these 55 were successful.

Barwala-Hissar (*katcha*).—One mile was planted in previous years. There were 122 trees existing at the commencement of the year, 100 trees were added during the past year, and of these only 25 were successful.

Barwala to Tohana (*katcha*).—One mile was planted in previous years. There were 100 trees existing at the commencement of the year, 100 new trees were added, and of these only 20 were successful.

Circular Roads (*katcha*).—One mile was planted in previous years. There were 122 trees existing at the commencement of the year; 50 new trees were added during the year, and of these 25 were successful.

Encamping-ground at Hansi.—There were 800 trees existing at the commencement of the year; no additions were made.

Encamping-ground at Bhiwani.—There were 100 trees existing at the commencement of the year; 100 new trees were added during the past year to replace those dead, and of these 50 were successful.

Banks of Rangoi Nala.—Five miles were planted in previous years. There were 1,000 trees existing at the commencement of the year; 500 new trees were added during the past year, but all these as well as 200 from those of previous years died.

Grove on Hansi Road at Barwala.—Twenty-five poles area, planted in previous years. There were 122 trees existing at the commencement of the year; no additions were made.

Nursery at Hansi encamping-ground.—Five hundred square feet in area planted in previous years. There were 2,500 trees existing at the commencement of the year; of these 1,587 trees were issued to Bhiwani tahsil; 52 trees were planted during the past year, but all died.

Nursery on Barwala and Tohana Road.—Thirty-five poles in area, planted in previous years. There were 165 trees existing at the commencement of the year; 100 new trees were planted during the past year, and of these 95 were successful.

Nursery on Barwala and Hissar Road.—Thirty poles in area, planted in previous years. There were 60 trees existing at the commencement of the year; no additions were made.

Station Garden at Hissar.—Seven acres 1 rood and 25 poles in area planted in previous years. There were 822 trees existing at the commencement of the year, of which 352 were cut down, and 224 new trees were added during the past year. Of the latter only 112 were successful.

Park at Hissar.—Seven acres 3 roods and 10 poles in area planted in previous years. There were 1,621 trees existing at the commencement of the year; 778 new trees were added during the year under report, and all were successful.

Establishment.—The establishment entertained consists of 23 malis and 18 pakhalis and bhistis, costing Rs. 2,580. The arboricultural operations at the Sadr are supervised by the Deputy Commissioner personally, assisted by the tahsildar and other subordinates, and in the interior of the district by tahsildars and tahsil establishments.

Financial Results.—These are as follows:—

	Rs.	Rs.
Receipts—		
By sale of fallen trees	91	
Do. of vegetables, &c.	40	
		131
Charges—		
Establishments	2,580	
Irrigation dues	217	
Feed and keep of 5 pairs of bullocks	786	
Purchase of seed and planting operations	269	
Fencing	238	
Miscellaneous expenses	499	
		4,589
Deficit ...		4,458

5.—ROHTAK DISTRICT.

General Remarks.—During the year under report there have been no abnormal features which can be said to have affected the work of arboriculture, which however has not progressed very satisfactorily. This district is so far peculiarly situated that it is without a single stream of any importance, and has to depend for its water-supply for the most part on tanks, which, as a rule, do not long retain water, and on wells which are very deep and are in the main only used for purely agricultural purposes. The canal, it is true, comes in very serviceably in the Gohana tahsil, and also in parts of Sampla tahsil; but it may be said that by far the greater portion of the district is absolutely dependent, in so far as arboricultural operations are concerned, on the rainfall, which here seldom exceeds 20 inches in the year.

Arboricultural operations are therefore in Rohtak carried on with some difficulty, and it can only be by incessant and unrelaxed efforts that any improvement can be effected in a naturally dry and treeless country. Tree-planting in the district appears to have been taken up by fits and starts as each successive Deputy Commissioner took an interest in a question which it can hardly be denied is one of grave importance, for it is not merely the embellishment of the country which has to be considered. A far greater need than that is the comfort and convenience of the people; and when the two objects are so intimately bound up together, it does seem a lamentable pity that greater and more consistent efforts have not been made everywhere in the direction of the creation of avenues of trees on roadsides.

The 38 malis and 25 bhistis of which the establishment formerly consisted were scattered over 16 roads. In other words, they were doing nothing at all. They were supposed to perambulate and look after the young trees, &c.; but with no one to superintend them, as might be expected, they did nothing, and even the roadsides close to the station itself were in a most neglected condition. As to nurseries, there was only one. This was at the Sadr; and it contained perhaps 200 young tali saplings and a few slips of "oleander." The following arrangements have now been initiated: four separate gangs were made up, one for each tahsil, and they were each put to work on one line of road and kept exclusively to that road; a quite separate establishment of 4 beldars and 3 bhistis with pakhal bullocks being allowed for the Sadr station. The nursery at the Sadr was at the same time much enlarged, and this is now stocked with thousands of saplings of sorts, most of which are in a fairly promising condition.

The following roads were taken up :—

The Rohtak gang, 13 in all, were put to work on the Rohtak-Bhiwani road, beginning at Rohtak.

The Jhajjar gang, 22 in all, were put on the Rohtak and Jhajjar road, beginning at Jhajjar.

The Sampla gang, 17 in all, were put on the Rohtak and Sampla road, beginning at Sampla.

The Gohana gang, 11 in all, were put on the Gohana-Mahm road, beginning at Gohana.

Description of Work.—The Rohtak and Jhajjar Road, 22 miles in length. On the whole this road is fairly well provided with trees; most of these are young and give little shelter. Towards Jhajjar the line is in better order and the trees are larger. One arboricultural gang is now employed on this line and is working steadily down towards Rohtak from Jhajjar, repairing the fences and preparing for the insertion of fresh saplings in the rains. Last year's neglect has been fatal to many of the young trees on this road, and gaps are numerous.

The Rohtak and Bhiwani Road, 17 miles. Here there has also been great neglect. The Rohtak arboricultural gang is at work on this line and is making most satisfactory progress.

Jhajjar to Jahazgarh Fair, 5 miles. Trees have been planted out along the roadway and are doing well. Each tree has its protector.

Rohtak to Sampla and on to Bahadurgarh, 27 miles. This line, in the vicinity of Sampla tahsil, has been pretty well looked after, but from Rohtak to Sampla there has been much neglect near the Sadr station. The Sampla gang is now at work on this line. The station road in Rohtak has been well provided with trees, and a number of bor and tali have been planted round one of the tanks opposite the tahsil. Every tree planted has its protector, either of earthwork or of thorns. The cemetery road and the borders of the cemetery have likewise been seen to; but the statistics of these operations belong to next year's report.

The Circular Road, 3½ miles, at the Sadr, has been completely neglected. There are the remains of a few withered stumps near the Sessions House, and towards the junction of the road with the Hissar road there are some 200 healthy tali trees. Nothing much can be done here till the rains set in.

At Jhajjar the roadsides are well provided with avenues, and the Circular Road that goes round the town has been attended to in some measure. The tahsildar has likewise planted trees on either side of a road that goes to a large tank, and to some fine old Muhammadan remains about a mile from the city.

Plantations and Nurseries.—In the Sadr there is a very fine young plantation between the kutcherry and the public gardens, and this will in a few years be a great ornament to the station and afford pleasant shelter to people waiting about the courts.

There is a grove of good trees also at the dâk bungalow, but this in no sense of the term can be called a plantation, as also another grove on the other side of the roadway to the east of the public garden. The trees in both these groves cover a considerable area and are in a healthy condition. The nursery at the Sadr has been very much enlarged, and from it saplings ought to be forthcoming in the rains to plant out a good many miles of road.

Establishment.—The following establishment has been kept up during the year: 4 jamadars, 31 malis and 27 bhistis, costing Rs. 3,570. The matter of supervision is the great difficulty. There is a jemadar at the Sadr who periodically goes along the various roads to inspect, and his reports are brought direct to the Deputy Commissioner. The tahsildars likewise report fortnightly. The tahsildars and naib-tahsildars have been requested to inspect the works as they proceed, and the District Superintendent and the Educational District Inspector have been also asked to note the way the works are going on and to report what they may observe.

Financial Results.—The financial results are poor indeed, as will be seen by the annexed statement. But much of an income can hardly be expected in such a treeless district. The expenditure is, and must be, heavy for years; but the expenditure is, I think, a legitimate charge on the funds, for in return the people of the district will, if present arrangements are acted up to, have shade and shelter on roads which hitherto have known little of either.

The following is an abstract of the results:—

	Rs.	Rs.
Receipts—		
By sale of trees	133	
		133
Charges—		
Establishment	3,570	
Water-rent	57	
Miscellaneous charges	193	
		3,820
Deficit ...		3,687

No. 6—SIRSA DISTRICT.

General Remarks.—During this year the rainfall in each of the tahsils was much less than the average of the 5 previous years. This scanty rain did not favor any new work being undertaken this year. Besides, some of the trees planted in former years dried up for want of adequate moisture.

Description of Work.—The work was chiefly confined to the filling up of gaps caused by the drying up of trees on roadsides. Trees so transplanted were generally from 2 to 3 years old and not less than two feet high. Of the new trees planted during the year 71 per cent. were successful.

Seeds of *Eucalyptus* were obtained from the Conservator of Forests and sown in the Jail and the Station Gardens at Sirsa; but owing to the unfavorable season some of them died soon after germination, and others did not germinate at all, notwithstanding due care and attention having been paid to the instructions received with them.

There are three nurseries in this district for rearing trees, and they chiefly supplied trees to fill up the blanks in the avenues. Besides the old trees, 1,388 seedlings of this year are reported to have sprung up. The Dhanur nursery on the Ghaggar and the nursery at Sirsa supply trees to the roads in tahsils Sirsa and Dabwali. The roads of tahsil Fazilka received their supply from the Fazilka nursery on the Sutlej. Fruit trees are also cultivated in them, but the number and species reared this year cannot be precisely stated. Pomegranate, lemon and guava are among the species of trees that are generally cultivated in these nurseries.

On various scattered plots trees were planted during the year, and old trees were maintained as set forth in the statement.

The young trees planted on roadsides were fenced with thorns, and in winter they were protected from frost by grass coverings.

The trees indigenous to the soil of this district are kikar and beri. They generally grow without much care or attention. Siriss and tali are also sown, and in tahsil Fazilka, especially on the river-side, they thrive well. Nim is sown to some extent. These species of trees form the road avenues, but kikar trees flourish most and are found every where in abundance.

Establishment and Supervision.—The following establishment has been entertained during the year:—

						Rs.	A.	P.	Rs.	A. P.
1 chaukidar costing		...	...	...		60	0	0		
1 mali	Do.	...	...	...		72	0	0		
2 coolies	Do.	...	...	...		120	0	0		
8 bhistis	Do.	...	...	...		228	0	0		
					Total Rs.	480	0	0		

Financial Results.

Receipts.—By sale of dry and fallen trees			...	...		111	4	3		
Ditto fruits, &c.			...	...		49	12	3		
									161	0 6
Charges.—Establishment			...	...	...	480	0	0		
Water-rent			...	...	...	60	0	0		
Feed and keep of cattle			...	...	...	70	0	0		
Miscellaneous charges			...	...	...	31	13	7		
									641	13 7
						Deficit			480	13 1

No. 7.—UMBALLA DISTRICT.

General Remarks.—There have been no events peculiar to the year under report affecting arboriculture in this district.

Description of Work.—Two roads were dealt with during the year in question, namely, "the Umballa and Pihewa roads," and "the Jagadhri Chachrauli road;" 3,415 new trees were planted on the former road; out of this number 60 are said to have failed. This shows a percentage of 98 of successful plantation. On the latter road 1,048 trees have been planted, and the tahsildar reports that none have failed. Besides the two roads above mentioned gaps have been filled in on a great many roads, as detailed in the statement which accompanies my report. Almost all the roads in this district are well planted.

There are four nurseries in the district—3 situated along the Umballa and Pihewa road, and the fourth just outside the Umballa tahsil.

There are no groves here.

Establishment and Supervision.—The establishment employed on arboriculture works is as follows:—

					Rs.
33 gardeners costing	...	...	...	...	1,824
20 bhistis	..	...	...	...	800
					2,624

The gardeners are employed all the year round, the bhistis for 8 months during the year.

The work is supervised by tahsil jamildars, district overseers and mistris, also by the tahsildars and naib tahsildars.

Financial Results.—The following is a detail of the financial results of the arboricultural operations in this district for the year 1880-81:—

						Rs.	A.	P.	Rs.	A. P.
Receipts.—Sale of withered and fallen trees including pruned branches						1,601	6	9		
,, fruits			...	...	...	102	8	0		
,, "Lak"			...	...	...	136	0	0		
									1,839	14 9
Charges.—Establishments			...	...	...	2,624	0	0		
Cost of maintenance of 4 nurseries			...	...		192	11	8		
Cost of fencing and tools and plants			...	...		107	14	9		
									2,924	10 5
					Deficit	...			1,084	11 8

No. 8.— LUDHIANA DISTRICT.

General Remarks.—The rainfall was not equally distributed. In July and August together it exceeded the fall of the previous year by 24·1 inches, but there was no rain in September and October.

Description of Work.—Kalka Road. On these 26 miles of road 890 new trees were planted in lieu of those destroyed. All those planted in previous years are doing well.

Kotla Road—In the 13 miles of road on which trees were planted in previous years only 154 new trees were planted to replace those destroyed or dead.

Dakha and Raekot Road.—All the old trees are doing well on these 14½ miles of road, being well cared for.

Sidhwan to Raekot—On 2 miles of the road 1,056 young trees were planted this year, and 516 trees were planted in 19 miles in room of those that died or were destroyed. Four miles of this road still remains unplanted.

Rokri to Jagraon.—The old trees are doing well on these 4 miles of the road.

Samrala to Machiwara.—All the old trees planted on these 6 miles of road are doing well; 149 new trees were planted in lieu of those decayed.

Samrala to Khanna.—One hundred and fifty-seven trees were put in to replace old trees that were destroyed. All are doing well.

There were 81½ miles of road throughout the district on which 2,922 trees were planted to replace vacancies. About 80 per cent. of these succeeded.

Nurseries.—There are 3 nurseries for young trees in this district from which saplings are transplanted during the months of July and February, and which are sufficient for the requirements of the district; one nursery is at the Sadr, another at Bassian, and the third a mile from the town of Ludhiana.

Establishment and Supervision.—The establishment maintained consists of 10 malis and 70 bhistis and beldars costing Rs. 3,989.

The bhistis and beldars work in gangs, and they are supervised by the mates, and the whole are superintended by the sub-overseers of roads, of whom there is one in each tahsil.

Financial Results.

	Rs.	A.	P.	Rs.	A.	P.
Receipts.—By sale of trees		...		2,296	0	0
Charges.—Establishments	3,989	0	0			
Other expenses	335	9	5			
				4,324	0	0
Deficit ...				2,028	0	0

9.—SIMLA DISTRICT.

Blank.

10.—JULLUNDUR DISTRICT.

General Remarks.—No event specially affecting arboriculture occurred last year. A mali was sent in January 1880 to the Government plantation at Changa Manga, for acquiring a practical knowledge of arboriculture; he is still there.

Description of Work.—Roadside avenues.—Road from Jullundur to Tanda.—This road is 19 miles in length, of which 5 miles were planted in previous years and 2 miles in the year under report. The remaining 12 miles were planted in former years, but the trees failed. Trees planted in previous years on the above-mentioned 5 miles were in pretty good condition in the beginning of the year; 607 trees were planted during the year under report, of which 90 per cent. were successful.

Road from Banga to Garhshankar.—Length of road 6 miles, of which 2 miles were planted in previous years and 1 in 1880-81; of the trees planted during the year, 66 per cent. were successful, *i.e.*, 150 trees were planted in all, of which 100 are living.

The work of the year on other roads, as shown in the statement, was confined to filling gaps and blanks only.

The total number of trees planted during the year on roadsides was 4,140.

The instructions about lopping and pruning of trees as contained in Commissioner's Circular No. 190-2771, dated 11th December 1879, and previous Circular are duly acted upon. The following roadside avenues were trimmed during 1880-81:—

Jullundur to Nakodar	15	miles
Jullundur to Jhandu Singha (Hoshiarpur Road)	5½	„
Ladowal Road	2¼	„
Jullundur to Tanda	5	„
Phillour to Nurmahal	13	„
Nakodar to Malsian and Shahkot ...	10½	„
Phagwara to Banga	11¾	„
Banga to Nawashahr	8	„
Nawashahr to Jadlah	7	„
Rahon to Jadlah	2	„

Plantations.—There are 26 Government plantations, same as last year, on the banks of the Sutlej, 10 in Phillour, 15 in Nakodar, and 1 in Nawashahr tahsil.

Nurseries.—The Jullundur nursery garden supplied 4,192 trees during 1880-81, of which 2,617 were planted on district roads, 537 given to the Executive Engineer for planting on the Grand Trunk Road, and Jullundur and Kapurthala road; and 1,038 given to zemindars free of cost.

Establishment.—The district arboriculture establishment has been as follows :—

1 darogha @ Rs. 15 per mensem 6 peons @ „ 4 each „	To watch plantations on the river-side.
1 gardener @ „ 10 „ 4 coolies @ „ 4 each „	Jullundur nursery.

From the commencement of the year under report the establishment hitherto maintained from District Funds, consisting of a jemadar @ Rs. 7, and a peon @ Rs. 5, or Rs. 12 per mensem, in all, for the conservation of Bir Sarangwal was discontinued in consequence of the transfer of the rakh to the Forest Department.

No special establishment was entertained for the purposes of planting trees; noukar coolies employed on road repairs were made to plant trees as well as to look after roadside avenues; but in the hot weather extra bhistis were entertained at Rs. 4-8 each in the Nawashahr, Phillour and Jullundur tahsils.

Financial Results.

Receipts.—

	Rs.	
Sale of wood and grass on roadsides	2,702	
Do. Do. of plantations	87	
Do. fruit and vegetables of Jullundur nursery garden ...	293	Rs.
		3,082

Charges.—

Pay of arboriculture establishment	812	
Arboriculture contingencies	268	
Maintenance of roadside trees	436	
		1,516
Surplus ...		1,566

11.—HOSHIARPUR DISTRICT.

General Remarks.—During 1880-81 the seasons were on the whole favorable for arboriculture.

Efforts are made to have every road planted with trees at a distance of 30 feet apart.

Nurseries are kept up at frequent intervals. There are nurseries at many of the encamping-grounds, and the roadside malis are encouraged to keep up small nurseries of their own. There ought to be a nursery at intervals of every 5 or 6 miles.

Numerous nurseries which must be kept well stocked are the foundation of a successful system of district arboriculture.—The forethought which provides a supply of seedlings to be used 2 or 3 years hence is not natural to the majority of natives, and the subject requires to be constantly brought before even the educated officials. Nurseries are very apt to run dry. The tahsildar is quite pleased when he has provided 500 saplings, without thinking whether he has a supply coming on *for next year's use.*

It is a standing order that no trees less than 3 feet in height are to be planted. This is an order which has been inculcated with some pains and seems at last to be getting understood. It is much easier for a mali to get seedlings one year old than to get them 2 or 3 years old: he is very apt to plant out all his seedlings when they are 6 inches or a foot high, if he is not peremptorily checked. A tree 18 inches high when put out on the roadside will want watering for 2 years longer than one planted out when 3 feet high will require it. Planting out small saplings is a pure waste of money, for what one man can look after in the nursery, it will take 10 men at least to look after in "*situ*" on the roadside. The taller the trees are when planted out, the less expensive is the tending of them on the roadside, *i.e., the taller you can plant out your trees, the cheaper is your work.* Of course, there is a limit, but practice soon settles that; ordinarily in the rains trees can be planted out four and even five feet high.

Substantial fences are made to each tree of dry thorns or of *Euphorbia* plants.

The species of trees planted are mango, tali, tun, pipal, baniyan, jaman, *Eucalyptus tereticornis,* and bamboo.

The species *generally* forbidden are siriss, kikar, ber, phuta, drek.

In this district where good trees will grow rapidly it is a great mistake to plant inferior ones.

The District Engineer is now making sowings also of the following :—

(*Bassia latifolia*) Mawwa.

(*Ficus venosa*) Pilkhan.

(*Pentaptera arjuna*) Arjan.

(*Ulmus integrifolia*) Rajain, and

(*Patajana Roxburghii*) Patajan.

There is also a nursery containing a large number of the following species :—
Mawwa.

Eucalyptus tereticornis (during the past year 00 plants of this tree have been taken out of the nurseries).

Maulsari (*Mimusops elengi*).

Kilawa (*Wrightea mollissima*) much used by turners.

Simmal (*Bombax hepiaphyllum*).

Chinar (*Platanus orientalis*).

Katalpa (*Bignonia Katalpa*) seed has germinated well.

In some places the roadsides have been planted with aloe. "*Agave Americana,*" says Mr. Faddy, "has been extensively planted out on roadsides as well as for fences of encamping-grounds. From experiments carried on in 1880, it was found possible to realize as much as Rs. 8 per maund for the washed and pickled fibres of this useful shrub in the Calcutta, market."

A species of *Eucalyptus,* the seed of which was received from Hazara, has been very successfully propagated in this district. We have trees between thirty and forty feet high not five years old yet, with a girth of upwards of eighteen inches. The species is, I believe, *tereticornis.* The Deputy Commissioner took occasion last year, when at Lahore, to introduce it to the notice of the Agri-Horticultural Society, and he obtained several pounds of the seed for distribution. Several trial plantations of this *Eucalyptus* have now been made in and near the station, and there is a fine avenue of them on one of the station roads. The *Eucalyptus tereticornis* is described by one Australian authority as "suitable for rails and posts as well as for fuel (*Woolls*);" and by another as "an excellent timber, much used for ploughbeams, poles and shafts for drags and carts, spokes for wheels, as well as in ship-building (*Moore*)." It seems very closely allied to *Eucalyptus rostrata.* We have also succeeded well with *rostrata,* a consignment of which was received from Dr. Brandis; but the trees of it are not yet so old. The *goniocalyx,* a supply of the seed of which was also kindly supplied by Dr. Brandis, has not done very well. A great many of the young plants have died, but a few vigorous ones are doing well. Its opposite, sessile, kidney-shaped leaves are a very characteristic distinction of the species. *Globulus* is a failure here: one specimen has survived in the station of Hoshiarpur, and there are perhaps half a dozen at Bharwain. The *citriodora* has also proved delicate. The *tereticornis* seems undoubtedly the species for the Punjab. It is very handy and rapid of growth, and soon gets beyond the need of watering.

One tree should be mentioned as a very rapidly growing umbrageous tree: though one which does not attain to a very large size, (*i*), *Gmelina arborea.* A good many of them have been planted; they attain quickly the condition of a moderate sized and very umbrageous tree.

The tun tree grows very easily in the district, especially at Bharwain, and it might be introduced with advantage largely in the reserves of Lohara and Panjal. This is quite its habitat.

Rats, which are a common farmer's-pest in this district, did a good deal of damage to young trees during the year. The District Engineer reports that, during the year, the arboriculture establishments have been supplied with proper tools, *viz.*, one axe, one saw, one pruning knife, all of English pattern made up locally and costing Rs. 1-12-0, Rs. 1-8-0 and annas 14 respectively. These implements he reports have been found very effective and cheaper than if supplied from Roorkee or Calcutta. The subject of trimming and lopping has received attention under the orders of the Commissioner, and the establishments have improved in their practice in this respect. Trees to be thinned out are blazed by the District Engineer. During the first part of the year, Mr. Tesfeledt, a European, was employed on this work in Unah pargana for a short time on the Commissioner's recommendation.

Description of Work.—The progress has been satisfactory except in Unah pargana. The subject has not yet been taken up in that pargana by the local officials with intelligence and zeal.

The statement shows that 56 miles of trees have been planted during the year, and that out of 680 miles of road in the district 310¼ are now planted.

The subject of planting out the encamping-grounds of this district with mango trees has formed the subject of correspondence with the Commissioner's office. Since operations commenced it has been found that the plan is a good one, and likely to prove most remunerative to Government.

Those first undertaken were the encamping-grounds at Hariana, Garhdiwala and Bullowal; and those at Mahilpur, Una, Nurpur, Chururu, Daulatpur, Mangowal have all been more or less completely planted out.

The encamping-ground at Talwara, Hajipur, Mukerian, Dasuya, Tanda, Garhshankar have also had some mango trees (some of them in considerable numbers) planted in them.

There has been planted out, therefore, an area of some 150 acres of mango gardens. This will in 10 to 20 years time probably bring in a large annual income to Government; there are still 150 acres more to plant out, and this will gradually be done. All this has been done with very little expense. What expense has been incurred has been borne by district funds, and if the encamping-grounds are not made over to the District Committee, Government should reimburse the committee for the expenditure incurred. In several cases the plan has been adopted of making over the encamping-ground (reserving a small area for tents) to zemindars on a lease for five years, on condition that they put in mango trees three feet high at once and take care of them for five years. This saves much trouble and expense, but it is quite necessary to lay down for them the lines in which the mangoes are to be planted. Hariana encamping-ground, about 25 out of 32 acres, has been given out on a lease of Rs. 150 per annum, for 5 years, on this condition. The lessees had to clear the soil of munj grass and stub up the roots of the tali trees, which were cleared off and sold. They have planted 400 mango trees on the lines laid down and are taking care of them. The trees are 2 or 3 years old, and in 7 or 8 years there ought to be a small income from fruit. The lessees act as our gardeners for 5 years and pay Rs. 6 per acre for the use of the ground.

Regarding the progress of the year the District Engineer writes:—"Considerable progress was made in Dasuya and Hoshiarpur sub-divisions; another season's work will see the road from Hoshiarpur to Tanda, Dasuya to Mukerian and Nawshera completed; all gaps and previous failures being made good.

The two most successful operations were:—

1*st*.—The planting out with mango trees of the Mahilpur encamping-ground, converting it into a valuable orchard.

2*nd*.—The completion in 6 weeks of the new diversion, Mandi and Phagwara road between Bhulewal and Kothie Kangar, by the planting of mango, tali, tallow tree, jaman and tun with bamboo ("Barundinacea") in the intervening spaces. The length of the road is 3 miles and 25 chains. The remaining portion will, it is expected, be completed during the rainy season of 1881."

Mr. Faddy, District Engineer, has been very helpful and suggestive in the matter of arboriculture. He has now gained much experience in the work, and has devoted a good deal of attention to the subject.

As regards *numbers* of trees planted during past years and the year under report, the following figures are furnished:—

	Roads.	Encamping-grounds.	Gardens.
Number of trees planted in previous years ...	84,340	13,795	6,065
Number of trees planted during 1880-81 ...	32,133	5,638	2,129
Total...	1,16,473	19,433	8,194
Number of trees that failed of those planted during the year	2,513	546	205
Number of trees now standing	1,13,960	18,887	7,989
Percentage of successful trees	92·2	90·4	...

These figures shew proportionally too large an amount of work done during the year under report: for it cannot be believed that more than ⅓rd of the work in tree-planting ever done in the district was done during 1880-81. The results, after much effort to get correct statistics, are humiliating. A renewed effort will, however, now be made to secure once for all a correct enumeration as a basis for future reports.

Establishments.

The following establishment is entertained :—

3 jamadars and

91 malis (distributed as shewn below).

On roadsides						69
Encamping-ground at	Hariana			1		
Do.	Garhdiwala			1		
Do.	Bullowal			1		
Do.	Tanda			1		
Do.	Mukerian			1		
Do.	Hajipur			1		
Do.	Talwara			1	14	
Do.	Garhshankar			1		
Do.	Mahilpur			1		
Do.	Una			1		
Do.	Nurpur			1		
Do.	Bharwain			1		
Do.	Daulatpur			1		
Do.	Gagret			1		
Tahsil garden at	Hoshiarpur			2	3	
Do.	Dasuya			1		
Roadside grove in hills at	Pandogah				1	
Sadr station					4	

There is also a temporary addition to establishment made during the hot weather, *viz.* an extra supply of bhistis to water the trees. This temporary establishment cost during the year under report Rs. 846-8-0.

The whole establishment is supervised by the District Engineer and four Sub-Overseers, also by the tahsildars.

Among tahsildars, Muhammad Ali, tahsildar of Hoshiarpur, has displayed most energy and met with most success.

It will be seen that a good many of the establishment are employed on the encamping-grounds. These are not the property of the District Fund; and they should either be made over to the District Fund or the Provincial Fund should recoup the District Fund for the money expended on them the last two years.

Financial Results.

Income.

		Rs.
By sale of dried timber		3,457
Do. grass		95
Do. khar khana		110
Do. lac		578
Do. fruit		48
	Total	4,288

This is exclusive of the income from encamping-grounds which is credited to Provincial revenues. The income of the encamping-grounds during the past year was—

		Rs.
By farming land		772
Do. sale of grass		188
Do. of lac		5
Do. munj grass		2
Do. of trees cut		3,326
	Total	4,293

This income is abnormally large, because it includes the price of timber cut down on the encamping-grounds of Hariana, Garhdiwala and Bullowal and the thinnings of about 25 miles of road in Una pargana, which had not been thinned for a long time. Every effort is made to develope the income from roadside arboriculture, and it is hoped that soon the mango trees and sale of bamboos will form an addition to the income.

Expenditure.

	Rs.
Pay of establishment maintained throughout the year	4,726
Do. temporary	846
Annual subscription to Agri-Horticultural Society	120
Cost of mushk and buckets	106
Price of carriage of seeds	19
Tools	100
Cost of cutting	107
Total	6,024

It will be seen that the strong establishment entertained involves a heavy expenditure. But it may be hoped that the average income will increase and the expenditure remain stationary.

Abstract of Financial results.

	Rs.
Receipts	8,581
Charges	6,024
Surplus	2,557

12.—KANGRA DISTRICT.

Report not received.

13.—AMRITSAR DISTRICT.

General Remarks.—Two new plantations have been begun during the year at Tarn Taran and Wazir Bhullar, and they give signs of success. Nearly 1,000 seedlings have been given away in addition to those planted out in the district. A large part of the Gujranwala road has been planted with roadside trees. Efforts are being made to increase the number of tun and fruit trees. In other respects the work has been the ordinary routine.

Description of Work.—The blanks of the district roads were filled up properly in different parts of the district on the roads shown in the statement. There are 4 plantations in the district, *viz.*, Sadr, Chogowan, Wazir Bhullar and Tarn Taran; of these 2 are well stocked with various sorts of trees. The Sadr plantation contains about 15,600 young trees fit for transplanting, being one and two years old.

The Chogowan nursery at present contains 3,600 young trees, all of which are doing well. The two plantations at Wazir Bhullar and Tarn Taran have been started during the year and are in a satisfactory condition.

Nine hundred and ninety-five trees have been given away during the year, in addition to those planted on the roads. It was proposed last year to improve the groves for convenience of travellers. This proposition has been partly taken in hand, and it is hoped will be completed during the current year.

Establishment and Supervision.—The strength of the establishment employed on the maintenance of roadside trees was the same as in last year, except a slight increase and decrease in the number of beldars and bhistis, in order to meet special works taken in hand from time to time.

Financial Results.—The total amount of expenditure for the year under report was Rs. 7,160, *viz.*, Rs. 997 from the General Local Fund, and the remainder Rs. 6,163 from the District Fund as detailed below:—

	Rs.
(1) Establishment	6,200
(2) Miscellaneous charges	960
Total ...	7,160

The miscellaneous charges include the cost of transplanting, carriage of trees, thatching for shade and shelter in the cold season, canal-water revenue, ploughing nurseries, manure, &c. The total amount realized by sale of dry trees and branches amounts to Rs. 900, against Rs. 954 realized during the last year, during which some avenues required special thinning.

Abstract.

	Rs.
Receipts	900
Charges	7,160
Deficit ...	6,260

14.—GURDASPUR DISTRICT.

General Remarks.—Nothing unusual transpired during the year under report so as to call for special remarks. The fall of rain, though somewhat scanty as compared with the average fall for the past 18 years, was sufficient for arboricultural purposes.

Description of Work.—The annexed statement will show the amount of work done during the year, and it is needless to recapitulate it here. The condition of the avenues and plantations is nearly the same as in the beginning of the year. The arboricultural operations were generally confined to the filling up of gaps on the first 4 or 5 miles of the most frequented roads. When the trees grow sufficiently not to require any further care the operations will be extended. Sufficient exertions have, however, not been made in developing and extending arbori-

culture in the district. It is no doubt very difficult to grow and preserve trees on so many roads without incurring considerable expenditure; but with a little more attention to the subject something better may be hoped for, and it is under consideration what means can be adopted to effect an improvement. For the purpose of showing the state of the several avenues and plantations, they have been divided into 3 parts. Those marked "A" in the List, may be considered to be in a flourishing condition and have only a gap here and there, to fill up which efforts are now being made. The lines marked " B " are also in fair condition, but nothing was done during the past year in the way of planting new trees in them for want of funds; while those marked " C" have a thin avenue in consequence of the soil not being adapted to the growth of trees or because the gaps have not yet been filled up.

Establishment and Supervision.—The following establishments were maintained for arboricultural purposes :—

11	malis
2	mates
8	coolies
42	bhistis

The roadside plantations are under the supervision of the tahsildars, District Engineer and Overseer, while the station gardens and nurseries are under the supervision of an Extra Assistant Commissioner.

Financial Results.—The subjoined statement will show the income and expenditure during the past year :—

Receipts.	Rs.	Rs.
By sale of trees and loppings	700	
„ „ garden produce	300	
		1,000

Charges.	Rs.	A.	P.	
Establishments	4,176	0	0	
Water rent	95	5	0	
Feed and keep of bullocks, &c.	634	5	0	
Contribution to Agri-Horticultural Society	240	0	0	
Miscellaneous charges.	36	6	0	
				5,182
Deficit				4,182

15.—SIALKOT DISTRICT.

General Remarks.—The rainfall of the year was small and much below the average, hence very little new work could be done, and the maintenance of existing avenues was of the first consideration. Owing to continued drought or insufficient rainfall and the difficulty of supplying water in certain tracts, many hundreds of fine trees died and were blown down by storms; but taking all these drawbacks into consideration the work done was fairly satisfactory. More than usual supervision was exercised both by tahsildars and District Officers during their tours this year

Description of Work.—In the Sialkot tahsil, 89 miles of roadside avenues were gone over and gaps filled up with 7,085 trees; 88 per cent. were successful.

In the Riah tahsil, 2 miles of the Amritsar road were newly planted with avenues on both sides, and 48 miles of existing avenues were gone over, and gaps filled up; 82 per cent. successful.

In the Pasrur tahsil, one mile of the Pasrur and Gujranwala road was planted with trees on both sides, and gaps in 107 miles of avenues were filled up; 2,492 trees were planted; 83 per cent. successful.

In the Zafarwal tahsil gaps were filled up in 33 miles of roadside avenues with 1,956 trees, of which 92 per cent. are reported to have survived.

All the roads in this district are very fairly planted with trees on both sides, and it is only necessary to continue to fill up gaps that may be caused by the removal of decayed trees and the withering up of young plants. It may be remarked that one of the chief causes of the failure of a large percentage of trees which one often sees, is, that very young seedlings are planted which are sure to perish unless most carefully cared for and protected. The success during the present year is due to more attention being given to the planting of older, and well-established saplings.

Nurseries.—Nurseries are maintained on the Amritsar road for supplying trees; 1¼ acres of ground has been sown with mango, mulberry, tali, siriss, behera and other seed; 2¾ acres have been cleared out for sowing next season, and 7 acres are well stocked with trees, most of which will be transplanted next spring, and the ground again prepared for further sowings.

The District Fund garden in the cantonment of Sialkot is in a flourishing condition; it contains a large number of fruit trees, shrubs and flowering plants, and a nursery of 3 acres is kept up for supplying suitable trees for roadsides, as well as good fruit trees and flowering shrubs to the people of the district. No less than 1,200 trees were given away, gratis, during the year under report, to zemindars, besides 800 Chinese mulberry, of which plant 1,000 more cuttings have been put down. The income is increasing annually, and is now little less than the expenditure.

Seeds of several species of *Eucalypti* were obtained from the Conservator of Forests and the Agri-Horticultural Society. Sowings were made in February last; the seed germinated fairly, and there are now several hundreds of healthy plants, which, if they survive the ensuing rainy season, will be fit to plant out next spring. Varieties of this tree have been successfully planted in different parts of the garden without removing them from the pots in which the plants were grown. This mode of planting has been found to be more successful than removing them from the pots; the bottom of the pots are broken to admit of the roots penetrating the soil.

A small quantity of carob seed was also sown: the seed germinated fairly well; but many of the young seedlings died or rotted off. There are still however a number of thriving plants which will be planted out next spring.

The olives in the garden are thriving; but the fruit, which sets well, drops off as usual.

About 150 grafted mango trees, obtained from Saharanpur, were planted a couple of years ago and are now in a flourishing condition. Grafts will be taken from these and distributed to the zemindars, who seem to be particularly anxious to have them. They are, however, difficult to rear, requiring plenty of water in the summer and protection from frost and cold for several years, which makes them very expensive.

There is a garden at the Pasrur tahsil and one also at Zaffarwal where small nurseries for supplying trees for roadsides are kept up.

The work of fencing and protection of trees is done by the arboricultural establishment without any extra cost. Fencing with the ("thor") *Euphorbia* has been found best, though occasionally mud walls have been built round the trees, and sometimes thorn bushes have been found to answer.

The operation of lopping and pruning trees is performed twice a year; the indiscriminate use of the pruning hook and saw is not permitted, and is only allowed where absolutely necessary.

More supervision has been exercised over the collection of decayed trees and tree-lopping and better arrangements have been made for their disposal, in consequence of which the income from this source has largely increased. The immediate collection and sale of fallen trees is very necessary, as otherwise the greater part of the branches are carried off by villagers and almost the bare trunk left.

Establishment.—The following permanent establishment was employed during the year: 1 supervisor, 8 malis, 1 cooli and 55 bhistis.

Financial Results.—The following shows the receipts and charges under the head of arboriculture:—

		Rs.	A.	P.
Receipts.—By sale of trees and of loppings	...	2,314	4	2
	Rs. A. P.			
Charges.—Establishments ...	2,347 12 0			
Other expenses ...	70 8 11			
		2,418	4	11
Deficit		104	0	9

There is every prospect that with care and supervision the income will henceforward exceed the expenditure. Arrangements have been made for increasing the supervision by making over the superintendence to a special man instead of its forming, as heretofore, a portion of the duties of the Superintendent of the District Fund Works.

16.—LAHORE DISTRICT.

General Remarks.—The year was remarkable for its deficient rainfall, and doubtless the operations of the year were somewhat hindered thereby.

Description of Work.—It will be observed that the operations of the year were restricted to roadside planting, except that, in the Chunian tahsil, 1,225 trees are reported to have been planted near wells. Eight-and-a-half miles of avenue were planted. In addition to the planting done in the district, 715 trees were planted on roads in the civil station by the

municipal establishment. The tahsildars of Lahore, Kasur and Sharakpur have done very little work indeed, and their attention will be directed to this important branch of their duties. It is not quite clear what proportion of the trees planted have survived, but enquiries will be made on this point.

A large area of the district is under rakhs, and doubtless under the auspices of the Forest Department arboriculture is extensively practised, while there is but little scope left for the District establishment beyond roadside planting.

Establishment and Supervision.—The following is a detail of the establishment employed :—1 jemadar, 8 chaprassis, 2 malis, 2 beldars and 21 bhistis.

Some supervision is exercised by the tahsil sub-overseers when inspecting the roads and other works in progress.

Financial Results.—The financial results are as follows :—

		Rs.	A.	P.
Receipts by sale of trees, &c.	...	72	0	6
Charges	...	2,320	2	9
Deficit		2,248	2	3

17.—FEROZEPORE DISTRICT.

The Commissioner of Lahore considers the manner in which the report has been drawn up discreditable to the officer in charge, and the Conservator regrets that he has not been able to make anything of it.

It appears that the following *establishment* was kept up :—1 daroga, 1 jemadar, 8 chaprassis, 1 gardener and 79 bhistis.

The *financial* results were as follows :—

		Rs.	A.	P.
Receipts.—By sale proceeds of prunings	...	310	6	3
Charges.—Establishment, &c.	...	5,384	2	11
Deficit		5,073	12	8

18.—GUJRANWALA DISTRICT.

General Remarks.—There was no event peculiar to the year under report which specially affected arboriculture. The rainfall, though not so abundant as in the preceding year, was sufficient for planting operations.

Description of Work.—The only important roads undertaken during the year in the Gujranwala tahsil were (1) Gujranwala to Hafizabad and (2) Gujranwala to Shekhupura ; 8 miles of each were planted with 2,500 and 4,860 trees respectively ; about 90 per cent. are reported to have succeeded. The trees planted on 15 miles of the Gujranwala and Hafizabad road in previous years are now from five to eight feet high and in good condition. One mile of the Gujranwala and Nowshera road was also planted with trees during the year, which succeeded. All blanks and gaps were filled, where necessary, on the roads planted before, and the usual establishment was kept up for the maintenance of roadside trees.

In Wazirabad no road was undertaken during the year. Operations were confined to going over old work and to the tending and preservation of old trees.

In Hafizabad, one mile of road from Hafizabad to Gujranwala was planted with 1,000 trees during the year: the success is reported to be partial. But, as remarked last year, it is not considered advisable to extend operations to any large extent, as the inferior soil of this tract of the *bár* is not well-suited for the growth of trees.

Nurseries.—In the Gujranwala tahsil six new nurseries were planted on the Gujranwala and Shekhupura road at different villages. The cost of planting amounted to Rs. 386. The trees in them are thriving and have grown from one to three feet high. In Wazirabad nothing was done in this direction during the year ; but in Hafizabad a nursery was planted near the tahsil building, and the trees are reported to be in good condition.

The method of planting consists in transplanting young trees from nurseriess, fencing them with mud walls, and watering them three times a week. Generally tali, siriss, mulberry and kikar are preferred for planting.

Lopping is periodically done with the saw; and the loppings are sold by auction to the highest bidder.

A quantity of *Eucalyptus* seed was received from the Agri-Horticultural Society during the year; the result of the experiment will be reported next year, as the seed was received at the end of the year.

Establishment and Supervision.—The following table shows the details of establishment employed:—

			Rs.
Four jemadars, costing	...	...	240
Two mates	...	...	55
One chaukidar	...	...	40
One mali	...	...	48
Two hundred and sixty-seven bhistis		...	3,416
	Total	...	3,799

The tahsildars and naib-tahsildars when moving about in their respective tahsils supervise the work of the establishment. The District Officer and the Assistant Commissioner make periodical inspection on their tours.

Financial Results.—		Rs.	Rs.
Receipts.—By sale of dry trees and loppings			... 458
Charges.—Establishments	...	... 3,799	
Other charges	...	... 706	= 4,505
		Deficit	... 4,047

19.—RAWALPINDI DISTRICT.

General Remarks.—The rainfall of the year having been insufficient, the planting of a large number of trees was deemed inadvisable, inasmuch as in most spots in this district artificial irrigation is impossible.

Description of Work.—For the above reason it was decided not to plant any new avenues in the district. The whole work done consisted in replacing trees which had dried up. In the tabular statement annexed, it must be understood that, when a number of miles is put down as having been planted, the meaning is that avenues of the length indicated were found to need replenishing and were replenished accordingly. It has been found impossible to determine the actual length of road planted in such cases.

In the course of the year under report, 970 trees were planted in the Sadr tahsil, and of these 354 had by the end of the year dried up: successfully planted 63·5 per cent. The percentage of trees successfully planted in the other tahsils cannot be given, but it is known to be considerably lower than in the Sadr tahsil.

The extremely unfavorable nature of the season under report may be imagined from the following facts:—

I.—In Attock tahsil 99 trees were planted between Saidan and Hazro, and they are reported to have all dried up.

II.—In 1879-80 in Pindigheb tahsil, on the road from Thatha Nur Ahmad Shah to Dhok Rahmat—a road too stony and sandy to admit of regular avenues being planted—7 groves or plantations of about 100 trees each were formed, and of these 4 may be said to have become non-existent.

III.—Of 6 groves or plantations planted between Thatha and Dhok Afghana in Pindigheb tahsil in 1879-80, 4 dried up during the dry weather of summer 1880, and had to be replanted during the following rains.

IV.—In Fatahjang tahsil, of 5 miles of avenue planted in 1879-80 between Fatahjang and Kali Pari, 3 miles dried up and had to be replanted in 1880-81.

Establishment and Supervision.—The establishment entertained for arboriculture is small in this district. The planting is done by the ordinary tahsil servants, and no permanent separate establishment is kept for the purpose. In 1877-78, 490 trees were planted on the undermentioned roads:—

I.—City to Chuhar Harpal.
II.—Sadr Kutcherry to Mera Khurd.
III.—Road from Artillery lines merging in above road.

In these roads 3 bhistis are employed on Rs. 7 per mensem each. Thus, the cost of preservation of each tree is 9 annas per annum. On emergencies extra bhistis are employed.

Financial Results.		Rs. A. P.
Receipts	...	39 12 0
Charges	...	293 0 0
Deficit	...	253 4 0

20.—JHELUM DISTRICT.

General Remarks.—During the year under report, owing to the scarcity of rain, the planting of trees was not practicable to an extent that would have been otherwise desirable; at the same time the work made fair progress.

Description of Work.—In Jhelum tahsil tali trees were planted on the sides of roads mentioned in the tabular statement, with result as follows:—

Trees planted	875
Trees died	175
Succeeded	700

In the Pind Dadan Khan tahsil 800 trees were planted, of which 300 failed, while the others are doing well. In Chakwal 146 trees were planted on various roads in place of those dried up in previous years. The newly planted trees succeeded well. In Talagang tahsil 880 trees were planted on roadsides, of which 405 died, and the remaining 475 are in good condition.

In Jhelum 5,200 cuttings were planted in the public garden, of which 1,800 died; and in Pind Dadan Khan garden 1,000 cuttings were planted, of which 200 failed.

In Chakwal and Talagang tahsils the following quantity of seed was sown and number of cuttings planted:—

Tahsil.	Seedlings sown.				Cuttings planted.			Remarks.
	Quantity of seeds in maunds.	Number of trees grown.	Number of trees failed.	Number of trees succeeded.	Number of cuttings planted.	Number of cuttings failed.	Number of cuttings succeeded.	
Chakwal ...	3	4,526	2,215	2,311	500	250	250	
Talagang ...	1	1,500	400	1,100	...	...	...	

The extent of previous planting in the district on avenues, &c., mentioned in the statement, is shown in column 5, and the extent of planting during the year in column 6; it should be added that of the fresh plantings in all about 25 per cent. died owing to the drought.

The best seasons for planting out are February, July and August; the work in these periods is taken in hand in accordance with instructions issued to the establishments. Young trees at least 6 feet high are chiefly transplanted to roadsides, as these trees thrive better than smaller plants and are less liable to injury from cattle. They are surrounded by a ditch of about a foot in depth for the reception of water, and protected by fences made of "pilchi" or "sanattha."

Establishment and Supervision.—The following establishment was entertained during the year:—

1 jamadar.
3 mates.
5 gardeners.
31 coolies.
7 bhistis and pakhalis.

On the remote outlying roads in the district, trees planted or the seedlings sown in the groves, &c., are left to the care of village headmen under the supervision of tahsildars, who inspect them during their circuit in the tahsils. This system works only fairly well, and it is intended to increase the paid establishments for the better tending of plantations, especially in times of drought.

Financial Results.—

	Rs.	Rs.
Receipts.—By sale of trees, &c.	290	
Do. of garden produce	613	= 913
Charges		4,197
Deficit ...		3,284

21.—GUJRAT DISTRICT.

General Remarks.—The year 1880-81 has been a dry year, and the rainfall has been very limited (15 inches and $\frac{5}{10}$ths), owing to which planting operations have not been carried out to a large extent. There are no large plantations and no fires have taken place, or any other events specially affecting arboricultural operations.

Description of Work.—Under this head it should be stated that young tali and kikar trees have been planted out in the gaps on the roads noted below, wherever they were required :—

I.—On the road from Gujrat towards Bhimbar, length about 24 miles—6 miles.
II.—On the Loop Road from Gujrat town to the Gujrat Railway station, about ¾ mile.
III.—On the Circular Road close to Sadr distillery building, Gujrat—1 mile.
IV.—On the road from Gujrat to Phalia 32 miles—1½ miles.

No new groves, nurseries or plantations have been planted out during the year under report.

There is one nursery at Gujrat in the church garden. In the beginning of the year it was in very good condition, but owing to want of rain, well water has been freely used to maintain it. From this nursery 400 young trees have been successfully planted out.

Establishment and Supervision.—The establishment noted below has been maintained during the year :—

	Rs.	
1 jemadar costing	96	per annum.
5 coolies ditto.	300	do.
1 chaukidar for watching roadside trees costing	60	do.
2 bhistis	60	do.
Total establishment	516	
Add contingencies, ...	43	
Total expenditure	559	

It does not appear from the report whether any revenue was collected during the year.

22.—SHAHPUR DISTRICT.

General Remarks.—Owing to scanty rainfall the year under report was very unfavorable for arboriculture; consequently operations were not taken in hand to a very large extent. Kikar seed was sown in the encamping-grounds at Laksin, Bhagtanwala, Kuthala and Badshahpur; but the experiment was not successful, owing to want of seasonable rain. These plots have not been included in the accompanying statement of groves and plantations, &c.

Description of Work.—Gaps and omissions were filled up on both sides of the road leading from Shahpur to the Kachewala ferry for a distance of 2½ miles with fair success.

The Lahore and Shahpur road near the Shahpur Police station was planted out with kikar and tali for a length of half a mile, and the young trees arein a flourishing condition. One hundred trees were planted this year in a plot of ground measuring about an acre near the stallion stables at Shahpur which was partly planted in previous years. Twenty of the new trees failed, and the rest are flourishing.

Some 80 trees (kikar and tali) were planted near the katcha tank at Shahpur, of which 10 have dried up and the rest are thriving.

The roads in the Kutcherry compound were planted out with fruit and ornamental trees.

The encamping-ground at Chak Ramdas (area 15 acres) was sown with kikar seed, of which only 2,000 germinated. Five hundred tali and mulberry trees were also planted, of which 300 failed. About 600 trees were planted in the encamping-ground at Bhera, but only half the number survived.

Two plots of land, measuring about half an acre each, were planted out near the serais at Khushab and Nurewala; the former with little and the latter with considerable success.

Kikar seed was sown in an area of three acres on a bank of the Corbynwali canal, and about 528 trees are doing well.

Besides the above, 5 nursery gardens were maintained; but these, as well as the station gardens at Shahpur, have not been included in the arboriculture statement.

Establishment and Supervision.—The permanent arboriculture establishment was :—

Gardens :—

7 malis @ Rs. 10 to Rs. 6 per mensem.

15 coolies @ Rs. 5 per mensem each.

Roadside trees and plantations :—

3 bhistis @ Rs. 5 each.

4 chaukidars @ Rs. 5 each.

Besides this, coolies and chaukidars were employed for short periods as occasion required.

At the Sadr station the gardens and plantations are under the supervision of the Judicial Assistant, and in the tahsils they are under the supervision of the tahsildars.

Financial Results.

		Rs.	
Receipts.—Sale of trees	78	Rs.	
Garden fruit	307		
		—	385
Charges.—Garden establishment			1,284
Roadside trees ditto			444
Temporary establishment			62
Contingencies—i. e., Purchase of bullocks			180
Repairs and construction of huts for malis and repairs of wells	287		
Other items, feed of bullocks, purchase of seed, &c. ...	540		
		—	1,007
Total ...			2,797
Deficit ...			2,412

23.—MOOLTAN DISTRICT.

General Remarks.—The rainfall throughout the district was 3·1 $\frac{4}{5}$ tenths less than the average of the past 5 years, except in tahsil Mailsi, where it was 3·7 more. During the year Imam Bakhsh, a young man of 21 years of age, was sent in accordance with suggestions contained in paragraph 6 of printed District and Canal Arboricultural Report for 1878-79, to Changa Manga, to receive a training in forestry. He received a stipend of Rs. 48 from the district, for the 6 months he was receiving his training. As soon as the planting season sets in, he will be sent out to the tahsils to superintend the planting of nurseries and roadside trees; and as he is an intelligent young man and professional mali, it is expected he will be able to give many practical directions.

Description of Work.—Tahsil of Mooltan.—In this tahsil only 462 trees were planted along the roadsides; the work was not progressive, but consisted of filling up gaps caused by trees having withered and died.

Tahsil Lodhran.—The largest amount of work was done in this tahsil, where 1,559 trees were planted along the roadsides; of these 928 were transplanted from the nurseries at Lodhran and Jalalpur, and the remaining 631, all kikar trees, were raised from seeds; 316 trees (out of the 1,559) were planted to replace those that had died last year; the rest consisted of progressive work along the following roads:—

(*a*)	Old Customs Line	628 trees
(*b*)	Lodhran and Jalalpur Road...	305 „
(*c*)	Mooltan and Bahawalpur Road	231 „

Tahsil Mailsi.—No new work was undertaken in this tahsil; it seems partly owing to the sandy soil and want of water, and partly to the destruction caused by whiteants. A great number of trees died in this tahsil; 875 trees were transplanted from the nurseries at Mailsi, Kahror, Tibba and Pakhi Mian, and planted along roadsides.

Tahsil Serai Sidhu.—Only 58 trees were planted along the road from the tahsil to the city.

Tahsil Lodhran.—About 300 new seedlings were raised during the year. There were 2,200 young plants in this nursery, of which 578 were transplanted along roadsides and 381 died. Tali, siriss and mango are raised from seed, and the pipal and bhur from cuttings.

Jalalpur.—At this nursery the plants consist of tali, siriss, bakain and pipal. About 250 new plants were raised. Of the 580 trees of last year, about 550 were transplanted and 70 died.

Tahsil Mailsi.—The nurseries of Mailsi, Kahror, Tibba and Pakhi Mian were stocked with about 4,615 plants consisting of pipal, bhur, tali and siriss. Of these 2,207, or one-half died, owing to want of water and destruction by white ants.

Tahsil erai Sidhu.—There were about a thousand young plants in the nursery at this place. About 450 tali, mulberry and pipal plants were raised during the year. A piece of ground about 1 kanal in area has been prepared near the tahsil as a nursery.

Tahsil Mooltan.—The following 339 trees were purchased at a cost of Rs. 501 from the garden of Sheikh Pir Shah, which had been purchased by the Sind Punjab and Delhi Railway as a site for the city station building. The trees were removed and planted in the Abid Khan, Langeh Khan and Am Khas gardens :—

Motia rabail	16
Orange trees	1
Fig trees	3
Rose flowers	17
Rabail	93
Nursery of roses	32
Sweet orange trees	45
Apple trees	46
Pomegranates	16
Bedmushk	23
Seti flower	3
Mango trees 3 years old	20
Ditto 1 year old	24
Total	339

Establishment and Supervision.—Tahsildars, naib-tahsildars and Naib Superintendents of Roads generally superintend the work. Major Lang, late Deputy Commissioner, visited the district and made many suggestions regarding improvements in this work; most of which, it is hoped, will be carried out in the present year.

Financial Results.—The cost of arboriculture during the year 1880-81 was as follows :—

		Rs.
Pay of establishment, 2 jemadars and 16 malis	=	1,164
Cost of trees purchased from Pir Shah	=	501
Fodder of 30 bullocks	=	397
Watering trees	=	389
Repairs to well and jhellar in the garden at Mailsi	=	83
Ditto at Pakhi Mian	=	8
Total		2,542

There was no income.

24.—JHANG DISTRICT.

General Remarks.—The scantiness of the rainfall which is recorded to average 12 inches, but which in my experience is much less, and the depth of the water below the surface render it impossible to plant continuous avenues. The rainfall of the year under review was only half the recorded average.

Small sections of the principal roads are all that can be planted, and these in the immediate neighbourhood of wells. But the country is not therefore treeless. Each well has its group of trees for shade and fruit, and in a year or two we hope to be able to supply the zemindars with really good fruit-trees from the station garden. The extremely dry heat that prevailed from April till the end of June had peculiar effects on the kikar trees. It burnt off all the foliage, and the trees stood black and leafless till the rains commenced.

A large portion of the Sajhawal plantation was washed away by the Jhelum, and a large number of tali trees disappeared.

Description of Work.—In the beginning of last year very few trees were found in the nursery fit for planting out, and a year or two will elapse before those that have now been put down have attained a sufficient size for planting out. However, 985 trees were planted out in the avenues mentioned in the accompanying return to fill the places of those which had withered away, and about three-fourths of these have been successful.

The fencing used consists of mud walls, which are made 3 or 4 for one rupee.

The mulberry is not successful as an avenue tree in this district. The white ants destroy it. It succeeds only in gardens with abundant moisture.

The best avenue trees here are banyan, pipal, tali, siriss both ordinary and white, kikar both ordinary and Cabul, tamarisk and ber.

The avenues are short sections planted on the different roads, wherever a convenient well supplied the necessary water. The only exception is the 3 mile length of avenue from Khaki Shah to Kharora, which borders a hot weather branch of the Chenab. The avenues were all in good condition at the beginning of the year, and all that has been done is to fill up gaps.

The nursery garden, under the superintendence of a really good gardener who was brought from Lahore in the beginning of the year, is now full of young trees. Bombay grafts of mangoes, plantains, peach, apricot, orange trees and vines have been procured, and in a few

years the garden ought to be able to supply the zemindars with really good fruit trees About 1,000 seedlings of *Eucalyptus* (species not known) have been raised, and are all flourishing. We have tried to plant the bank of the Kharora nullah with willow cuttings, and there are now some 400 trees about 6 feet high, looking very healthy. The rest of the 3 miles is being planted in the same way.

They will look very handsome in a year or two, and their roots will hold the bank together and keep the fine avenue from Kharora to Khaki Shah from being washed away.

The plantation at Sajhawal, of which the Alyana plantation, mentioned last year separately, is really a part, is a very fine one, composed chiefly of tali trees, but it has been much neglected.

A large number of the trees are growing so close together that they are nothing but leafless poles except the last few feet at the top. It is intended to effect a great clearance in the autumn, and the trees cut down should realise a handsome sum.

A large portion of the plantation, which has been recovered from the river, has been sown with tali seed, and it is hoped that many thousands of young trees have sprung up.

Willow cuttings have been put down on the bank of the river in large numbers.

On going over the plantations in the cold weather it was found that the cattle of neighbouring villages had eaten down all the young trees in the plantation. A chaukidar was appointed to keep out cattle, and on a recent visit it was observed that many thousands of young seedlings had sprung up. In a year or two we shall have more than enough young trees for road planting. The only other plantation requiring special mention is the garden attached to the civil bungalow at Chiniot. This is full of fine fruit-trees, and its well-kept state reflects great credit on Murad Ali, tahsildar.

Establishment and Supervision.—The following is the schedule of establishment:—

		Rs.	A.	P.
16 gardeners at the station garden costing		946	10	10
22 gardeners employed on avenues, &c.	...	1,258	0	0
Total 38 gardeners costing	...	2,204	10	10
Add cost of bhistis	...	475	7	5
Total	...	2,680	2	3

Supervision was carried on at Sadr nursery garden by one head gardener, under the immediate control of the Deputy Commissioner; and for station roadsides by one head gardener and two local fund peons; and the other avenues, groves and plantations, &c., are kept in order by the owners of wells, who are paid so much a month for watering and looking after the trees. They are under the immediate supervision of the tahsildars.

Financial Results.—

		Rs. A. P.	Rs. A. P.
Receipts.—Garden produce	...	119 . 6 6	
Sale proceeds of loppings	...	26 14 0	
Miscellaneous	...	13 8 0	
			159 12 6
Charges.—Pay of malis and bhistis	...	2,680-2-3	
Feed of bullocks	...	600-0-0	
Contingencies	...	293-13-6	
			3,573-15-9
		Deficit Rs.	3,414-3-3

25.—MONTGOMERY DISTRICT.

General Remarks.—The rainfall of the year was more favorable than in the preceding year. No fires occurred. In this district white ants are very destructive and do much more damage than they could do if wator were plentiful.

Description of Work.—The work done during the year consisted of planting trees on a mile of station roads, and replacing dead trees wherever required.

The percentage of trees successfully planted was about 50 per cent.

The condition of the avenues at the beginning of the year was generally good. The trees having been planted some years ago are not now likely to fail.

The following portions of the roads, *viz*:

Pakpattan	... 29 miles,
Dipalpur	... 32 miles,
Montgomery	... 11 miles,

are unplanted.

This is due chiefly, in the first and last mentioned tahsils, to scarcity of water along the roadsides; and in Dipalpur no work was done owing to there being changes among the tahsildars and no proposals having been submitted. Orders have been issued to tahsildars to take more interest in arboricultural operations in future.

The only places where topes, groves, plantations and nurseries exist are at Gugera and Atari. At both these the trees are large and require no particular care. The kinds of trees sown or planted are generally tali, kikar, pipal, bur, mango, mulberry and a few fruit-trees.

Establishment and Supervision.—The following establishment was maintained during the year, and the expenditure thereon amounted to Rs. 589, as follows:—

Montgomery Tahsil.				Rs.
1 contractor for watering trees at Chichawatni, at	Rs. 10	per mensem	=	120
1 cooly at Montgomery	„ 5	„	=	60
1 ditto ditto	„ 4-8	„	=	54
1 ditto ditto	„ 3	„	=	36
1 ditto ditto	„ 2	„	=	24
Add salary of extra establishment employed for broken periods				42
			Total Rs.	336

Gugera Tahsil.		
1 bhisti, at Rs. 5	=	60
1 Ditto for 4 months	=	20
	Total Rs.	80

Dipalpur Tahsil.		
1 contractor for watering trees, at Rs. 10 per mensem	=	120
Arrears of salary of previous year		5
	Total Rs.	125

Pakpattan Tahsil.		
1 contractor for watering trees, at Rs. 4	Total Rs.	48
		48
Total expenditure on establishment	Rs.	589

The establishment at Montgomery has worked under the supervision of the Deputy Commissioner, and those in other tahsils under that of tahsildars.

Financial Results.—There were no receipts from arboriculture. The charges were as follow:—

	Rs.
Maintenance of establishment as detailed above	589
Railway fare including wages of coolies for digging and planting and hackery hire of trees received from the Changa Manga plantations	471
Preparing ground for planting trees	86
Price of one pair of bullocks	40
Total expenditure, or deficit	Rs. 1,186

26.—MUZAFFARGARH DISTRICT.

General Remarks.—No events unfavorable for arboriculture are reported by the tahsildars to have occurred. The rainfall was good.

Description of Work.—During the year half a mile of trees was planted on the Rangpur road in extension of the six miles planted before, namely, 5 mulberry and 420 tali trees, of which 70 died and 84 per cent. survived.

A mile of trees was planted on the road between Muzaffargarh and Khangarh, 1,025 tali, 220 jaman, and 15 mulberry trees, of which 120 died and 91 per cent. survived. One hundred and twenty-five tali plants were planted in gaps on the road from the Taliri garden to its junction with the Khangarh road; 15 died and 110 are thriving. Twelve tali trees were planted in blanks on the road between the Taliri garden and the Ganeshwah bridge, all of which are in good condition. Half a mile of trees was planted on the road from the kutchery to the Ganeshwah bridge past the police office; 240 tali were planted, of which 87 per cent. were successful. Kussees were dug on both sides of the road from the Ganeshwah canal to water these trees at a cost of Rs. 105-12-0.

The roadside avenues on the Dera Ghazi Khan road past the station dispensary were completed and extended. Eighty-two tali and 12 mulberries were planted; 68 per cent. were successful. One-fourth of a mile of trees were planted on the station roads and some blanks were filled. Fourteen tali and 10 jaman trees were planted; 14 died and 10 are growing.

A mile was planted in extension of the 5th mile of trees on the Mohamad Kote and Ahsanpur road with 44 siriss and 969 tali trees, of which 513 died; 49 per cent. are thriving. The soil along this road is very bad.

Beyond Rukkanwali, where the Muzaffargarh tahsil ends and the Alipur tahsil begins, a quarter of a mile of trees was planted on the Khangarh and Alipur road in extension of a quarter mile of previous years with 500 tali trees, of which 300 died. On the Shahr Sultan and Alipur road half a mile was planted in extension of 4 miles of previous years; 400 tali were planted. All are in good condition.

On the Jatoi-Alipur road, Khairpur, and Alipur road one quarter and half miles of trees were newly planted with 200 and 400 trees respectively; 90 per cent. were successful in the first case. The trees planted on the latter road are all in good condition.

Trees were planted on the circular roads at Alipur, Jatoi and Khairpur; in the two latter cases for the first time and in Alipur in extension of the quarter mile planted before. Five hundred and five tali trees were planted in Jatoi, all of which are in good condition; and 36 trees were planted in Khairpur, which are all thriving. On the Walliwah canal one mile was planted with 156 tali trees, of which 14 died.

During the year an attempt was made to make plantations at various places in the district. With this view the places mentioned in the margin were selected, which were within reach of the sailab or of canal water. The lands were well ploughed and all weeds destroyed, after which tali seed, large supplies of which were obtained from Changa Manga, was sown broadcast. One maund to one-and-a-half maund of seed were sown per acre. The plantations are reported to be in good condition, with the exception of the plantation in mile No. 3 on the Muzaffargarh and Khangarh road.

1. Plot of ground near Muzaffargarh encamping-ground.
2. Plot of ground near Police Hospital.
3. Plot of ground near Langar serai, Police rest-house.
4. Plot of ground near station dispensary.
5. Plot of ground near the station cemetery.
6. Plot of ground near Mithriwala well.
7. Plot of ground near Treasury building.
8. Plot of ground at mile No. 3 Muzaffargarh and Khangarh road.
9. Saban Macchi Reserve.
10. Basti Arif.

Supplies of various sorts of fruit-trees, *Eucalyptus* and flower plants were obtained from the gardens of the Agri-Horticultural Society, Lahore, to which Rs. 240 were subscribed for the year; and the trees and plants received were planted in the Taliri garden, church compound, and in the garden formed at Sanawan.

Trees were planted in addition to those of previous years in the following encamping-grounds: Muzaffargarh, Kotadu, Khairpur, Kuraishi, Daera Dinpanah, Shahr Sultan, Khangarh, Mirwali, Jatoi and Alipur. The number of trees planted and the percentage of trees planted successfully are given in the tabular return.

Establishment and Supervision.—The following establishment has been entertained:—

1 jemadar, 13 malis and 70 bhistis.

The tahsildars exercise the necessary supervision.

Financial Results.

		Rs.	A.	P.	Rs.	A.	P.
Receipts.—By sale of trees	...	160	3	3			
Ditto fruits	...	148	15	0			
Ditto Vegetables	...	80	15	8			
					390	1	11
Charges.—Establishments	...	3,936	13	8			
Purchase of bullocks	...	265	0	0			
Feeding	...	1,251	3	3			
Clearing of kussees, wells, &c.	...	321	5	9			
Tools, &c.	...	230	0	11			
Purchase of trees, seed and planting	...	602	8	1			
Fencing	...	255	7	9			
Manure	...	203	3	9			
Subscription to Agri-Horticultural Society	...	240	0	0	7,305	5	2
Deficit	...				6,695	3	3

27.—DERA ISMAIL KHAN DISTRICT.

The report on arboricultural operations in this district has not been received.

28.—DERA GHAZI KHAN DISTRICT.

Description of Work.—About 5½ miles of avenues have been newly planted principally with tali, three miles on roads leading from the Sadr, 2 miles within the vicinity of Rajanpur and half a mile in Mithankot. On other roads already planted gaps have been filled up. In all 5,500 trees were planted during the year.

As previously reported, nurseries are maintained on all roads being planted. The following is a statement of roads on which nurseries exist :—

On Kot Chutta Road at different places	...	...	3
On Sheru Road	...	...	1
On Sakhi Sarwar Road	...	...	1
On Dera Ismail Khan Road	...	...	1

As plants are taken out of these nurseries, seed is sown and a fresh supply of plants thus regularly maintained. The plantation in Kot Haibat (written Kotla Sikhani by mistake last year) is getting on fairly. Besides tali, about a thousand young *Eucalyptus resinifera* trees have been planted in it and are doing well. The extension of this plantation with gum trees principally will be continued, and it is to be hoped with success. For the last two years back supplies of *Eucalyptus* seed have been obtained from Abbottabad, the plants raised from which are doing exceedingly well. Besides the number planted at Kot Haibat some thousands of young plants are being raised in nurseries in the Government garden. The nurseries in the Government garden, which are not shown in the statement accompanying this report, are stocked with *Eucalyptus* and fruit-trees of all kinds; the former, as already explained, are being planted in Kot Haibat as also in the gardens, and a few on roads in the station ; the latter, which consist of mangoes, jamans, pomegranates, peaches, limes, plums, figs, oranges, &c., are given to zemindars *gratis*. About 500 fruit-trees were thus distributed during the year under report. These fruit nurseries, although not strictly coming under arboricultural operations, assist arboriculture to a great extent, in so far as fruit-trees of large growth, such as mangoes and jamans when planted by zemindars on their wells, help to clothe the country. It is under contemplation to plant groves of mangoes along roadsides. One will be begun in July or August 1881 within the limits of the station, and by degrees the planting of such groves will be extended.

Establishments.—In all 44 bhistis were employed for watering trees on roadsides.

The expenditure during the year amounted to Rs. 4,497-2-2, against Rs. 4,033-8-3 of the previous year. A portion of this expenditure was incurred in getting from the Horticultural Society's Gardens, Lahore, and sending to the Biloch hills (Fort Munro), plants suitable for planting on those hills, such as pines, oaks, olives, &c.

29.—BANNU DISTRICT.

General Remarks.—The rainfall, though rather more than in 1879-80, was much below the average, especially in tahsils Laki, Isa Khel and Mujanwali. There was no other unusual event affecting arboriculture.

Description of Work.—Tahsil Bannu.—One thousand and two hundred and fifty trees were planted during the year on roadsides to fill up gaps. The tahsildar, in spite of repeated parwanas, has failed to give the percentage of success.

Tahsil Laki.—Six hundred trees were planted during the year to fill up blanks, 67 per cent. with success.

Tahsil Isa Khel.—Three hundred trees were planted during the year, 88 per cent. with success.

Tahsil Mujanwali.—One hundred and six trees were planted during the year, all with success, but 114 trees of previous years succumbed to drought.

Care is taken to thin out trees when necessary, and lopping is done in December and January; February, March and August are the months for planting.

Establishment and Supervision.—There are altogether 15 malis on roads and avenues throughout the district, who cost Rs 849-14-2 during the year under review. Besides the above, 3 malis are employed on the Nowrung nursery and on the station garden at Mujanwali.

Financial Result.—

The following is an account of the income and expenditure for 1880-81 :—

	Rs. A. P.		Rs. A. P.
Receipts.—By sale of trees		...	42 2 4
Establishments	1,041 14 2	...	
Charges.—Other expenses	160 14 6	...	1,202 12 8
	Deficit	...	1,160 10 4

30—PESHAWAR DISTRICT.

General Remarks.—This head calls for no special remarks, except that, owing to there being no rain in the beginning of the year under report, the few trees that were planted last year in the Peshawar tahsil died.

Description of Work.—Twenty-one thousand one hundred and eighty-one trees of various description were put out during the year at a cost of Rs. 8,193 or Rs. 1,716 more than the expenditure of the year before. The following are the details of the trees planted out on district roads, &c. :—

Tahsil Peshawar—		
Urmur Road	500	
Puhand Road	600	
Garhi Sirdar Road	500	
Cattle market-road	300	
Hashtnagar Road	700	
Edgah Road	400	
Charpenza Road	300	
Jubba Road	450	
Bara Road	600	
Bhana Mari Road	325	
Circular Road	800	
		5,475
Tahsil Mardan—		
Mangan Road	220	
Dasura Road	500	
Dispensary Road	240	
Rushkai Road	400	
Hoti Road	140	
		1,500
Tahsil Sawabi—		
Jehangera to Lahore	500	
Lahore to Zeda	250	
Ismaila to Ropi	1,000	
Manki to Amboi	259	
Maneri Road	600	
		2,600

Tahsil Hashtnagar.

Kheski to Abazai	1,500	
Charsadda to Nirulla	2,000	
		3,500

Tahsil Doaba Daudzai.

Mardan Road	665	
Hashtnagar „	605	
Charpenza „	700	
Mathra „	593	
Darbangi „	343	
Michni „	192	
Sarikh „	900	
Kangra „	305	
Abazai „	611	
		4,914

NURSERIES.

Tahsil Mardan.

Fatma Road	290	
Nisulla „	227	
Dheri Merwiez „	600	
Jelala „	775	
On this bank of Kalpani stream	1,300	
		3,192
Total ...		21,181

At the beginning of the year the trees planted out in the previous years were in good order. They were in need of water in some cases, especially in the *Mqiras* of Yusafzai subdivision, where wells for watering trees were sunk during the year, and in some cases "mushks" were supplied to the gardeners for the purpose of watering trees. Not less than 66 per cent. were successful during the year under review.

Establishment.—The strength and cost of the establishment employed for the different works was as follows:—

	Rs.
5 jemadars costing	624
95 malis „	6,108

The above establishment was supervised by the tahsildars of the district as well as by the members of the District Fund Committee in their respective ilaquas, to whom the work of tree-planting was entrusted.

Financial Results.

The following is the detail of receipts and charges:—

	Rs.	Rs.
Receipts.—Sale proceed of tree-branches during the year ...	57	
Charges.—Establishment	6,732	
Other expenses	1,461	
		8,193
Deficit		8,136

JHIL PLANTATION.

The receipts and charges of the Jhil plantation at Peshawar are as follows:—

	Rs.
Receipts.—By sale of grass	1,900
Charges.—Establishment, &c.	192
Surplus ...	1,708

31.—HAZARA DISTRICT.

General Remarks.—The rainfall, though normal, was not seasonable, consequently a very small proportion of the seed sown during the rains, germinated, but of the trees planted out in the spring all throve with the exception of some 5 per cent. owing to the copious and timely rainfall.

Description of Work.—In all 7,778 trees were planted, and 80 fruit trees were grafted; 9 maunds 10 seers seeds were sown.

There are 6 standing nurseries in this district,—at Haripur, Mansahra, Sultanpur, Shinkiari, Abbottabad and Civil Rakh, Abbottabad. From some of these young trees are supplied gratis to zemindars; 600 such trees were so given during the year. The zemindars plant in graveyards "ziarats" and round their dwellings.

From Haripur a fee of one anna per young tree, mostly fruit trees, is charged.

From Civil Rakh, Abbottabad, seedling trees are neither given to zemindars gratis nor on payment of fees. The young trees are planted out, as soon as they are strong enough, into different parts of the rakh, which is a barren hillside. This rakh was in the hands of the Horse-breeding Operations Department, who used the grass but have no concern with the trees or rather saplings; for all the trees are yet very young. Trees were planted previous to the year under report, round the few tanks there are fit for the purpose.

Roadside planting.—In all 8¼ miles of avenues were planted on roadsides, while 23 miles of avenues were completed. 5,289 trees were planted out in avenues during the year.

Nurseries.—Four acres 5 kanals 6 marlas of land were planted out as nurseries, while 14 acres 4 kanals 7 marlas of old nurseries were sown. 1,210 trees were planted, and 8 maunds 30 seers of seeds sown.

Gardens.—No new work: the gardens are quite large enough, 80 fruit-trees were successfully grafted during the year in the Abbottabad garden; 20 seers of seed were also sown. In the Haripur gardens 1,279 trees, the greater part fruit trees, were pricked out.

Establishment.—The following establishment has been maintained during the year:—

8 gardeners	...	costing Rs. 1,862.
5 malis	...	
1 watcher	...	
13 coolies	...	
7 bhistis	...	

The tahsildar of Haripur supervises the Haripur gardens and planting, and the tahsildar of Mansahra, the Mansahra planting. The Abbottabad gardens and planting are supervised by the Deputy Commissioner, the tahsildar and the head-gardener.

Financial Results.

		Rs.	A.	P.			
Receipts		1,548	0	0			
Charges.—Establishment		1,862	0	0			
Donation, Agri-Horticultural Society ...		120	0	0			
Other expenses		1,533	0	0			
					2,515	0	0
	Deficit ...				967	0	0

32.—KOHAT DISTRICT.

General Remarks.—Although the year under report was favorable as compared with the preceding one, still the rainfall, 15·3 inches, was sufficient. The operations of the year were, however, very limited in extent.

Description of Work.—Only tali and mulberry trees were planted by the Public Works Department on the Kohat-Hangu road. The percentage of trees planted successfully on that portion of the road is approximately 80.

Establishment and Supervision.—There was no establishment for this work during the year. The work was done under the supervision of the Executive Engineer.

Financial Results.

The funds at the disposal of the Committee were too small to admit of any arboricultural works. Rs. 1,000 have, however, been budgetted for 1881-82. Particular attention will be given to this subject during the curren year.

II.—CANAL ARBORICULTURE.

1.—Bari Doab, 1st Division.

General Remarks.—The rain-fall of the year was somewhat exceptional. It fell some what short of the average for the last 15 years, but its principal peculiarity was in its distribution. More than half the total amount fell between the 26th June and 19th July, and, with the exception of a heavy fall on 5th September, there was then almost an entire cessation till the end of December, when there were two showers, and then again a break until the 23rd February, when there was heavy cold weather rain and which went on until the end of the official year. This seriously inconvenienced the planting operations in the Division for which arrangements had been made, and resulted in a good many of the young trees dying.

Description of Work.—On the main branch the only planting done was in replacing dead trees. On the Kasúr and Sobraon branches nearly the whole of the spoil ground from Suthiali to the Grand Trunk Road was planted out with young trees at intervals of 50 feet apart, which gives three continuous lines on each side of the canal. The only parts not so planted are where the soil is too high to allow the water-courses which were taken out above each fall to deliver flow water into it, and these patches remain for future operation. Each tree is connected with the water-course so that it can be irrigated, and it has been protected by a thorn fence. About 10 per cent. of the trees planted in the rains failed, but they were replaced in part during the cold weather. Besides this, 70 acres were sown with seed in trenches on the Forest Department principle.

Establishment.—A Forester trained in the Changa Manga reserved forests was in charge of these planting operations, which extended over 60 miles of canal; his pay is Rs. 30 per mensem. Besides this, the following petty establishment was employed:—

5 malis
30 beldars
67 bhistis
} costing Rs. 1,858-8-0.

All this establishment is included in the expenditure shown against the plantations, Most of the men were employed for only part of the year. The failure of the rains necessitated so many bhistis being employed until the water-courses could be opened.

Financial results.—

		Receipts ...	Rs. 5,055
		Charges.	
Pay of Forester...	Rs. 360		
Planting ...	„ 4,106	...	„ 13,030
Maintenance ...	„ 8,564		
		Deficit ...	„ 7,975

Of the expenditure Rs. 3,950 were on account of construction of the irrigation water-courses, and which should correctly be distributed over a term of years; but the Examiner, Public Works, seeing difficulty in this, it was all charged off at once.

2.—Bari Doab, 2nd Division.

General Remarks.—The expenditure on planting operations was much curtailed during the year under review, and hence the progress, as shown in the accompanying form, has been small. A portion of the canal plantation near Changa Manga has been handed over to the Forest Department to serve as a training ground for native gardeners, who are sent for a course of practical instruction in forestry and will subsequently be employed in extending and maintaining the canal plantations. At present there are two men under training; but, if any progress is ever to be made in "reboising" those portions of the spoil banks where previous sowings have failed, many more trained men will be required, as well as a far more liberal supply of funds than was last year available.

Description of Work.—The work done during the year consisted in the planting out of 3,800 trees, of which 50 per cent. are probably still surviving. Pruning of plantations where necessary was also undertaken, and the proceeds sold as fuel.

Establishment and Supervision.—The management of the plantations is now directly under sub-overseers, the Foresters having been discharged. The remaining establishment consists of malis, labourers and bhistis, the total monthly cost of which is Rs. 315. Supervision of operations is effected by Canal officers.

Financial Results.—The financial results are as follows:—

Receipts.

	Rs. A. P.		Rs. A. P.
By sale of wood	6,645-9-4	...	13,083-5-7
Do. grass and other produce	„ 6,437-12-3		

Expenditure.

	Rs. A. P.		
Maintenance ...	1,396-4-7		
Completing line trees ...	1,537-3-6	...	6,429-10-9
Thinning out and stocking, &c, ...	3,496-2-8		
	Surplus Rs.	...	6,653-10-10

3.—Upper Sutlej Inundation Canals.

General Remarks.—There was a heavy flood in July 1880, by which the trees on the canal banks were well watered; some standing at the water's edge and overhanging the stream were carried away by the strong current.

Description of Work.—The trees on these canals are of spontaneous growth. The trees planted in the compounds of the Gudar Malkana Ladhawal, Bunga Hyat and Lodian chaukis a few years ago were tended and watered. No new planting was done during the year.

Establishment.—Four bhistis at Rs. 5 per mensem were employed during the year, one for each chauki compound mentioned above. Their work was supervised by the subordinates in charge of the canals.

Financial Results.—The income derived during the year was as follows:—

		Rs.	A.	P.
By sale of wood		139	3	0
Do. of grass	...	1,803	0	0
Total	...	1,942	3	0
Deduct expenditure	...	374	0	6
Net profit	...	1,568	2	6

These canals running in almost rainless districts and carrying a supply of water during only a portion of the year, cannot have their banks and "spoils" planted out systematically without a large expenditure, which the capital account cannot sustain. The chief part of the income in this division is derived from the sale of sarkanda grass, of which there is a copious growth on these canals, and which is in much demand by the zemindars.

4.—Lower Sutlej and Chenab Inundation Canals.

General Remarks.—Owing to want of funds no new planting operations could be undertaken during the year. The trees on the Chenab bund and in the chauki compounds have all to be watered, and this takes all the funds that are sanctioned.

Description of Work.—No new planting operations undertaken.

Trees on Chenab bund and in the chauki compounds have been kept watered.

Establishment and Supervision.—Twenty beldars and bhistis employed at Rs. 5 each. One pair of bullocks for Kehror compound at Rs. 15 per mensem, with occasional extra bhistis.

Financial Results.—

Receipts.

		Rs.	A.	P.
Sale of wood	...	2,117	11	0
Do. loong and sarkanda	...	3,029	8	6
Do. fruit	...	157	2	0
Do. crops	...	64	8	3
Total Rs.		5,368	13	9

Expenditure.

Watering trees, &c.	...	1,508	5	11
Surplus Rs.	...	3,860	7	10

5.—Indus Canal (Dera Ghazi Khan).

General Remarks.—The planting operations during the year have been fairly successful. The rain-fall as usual was very small but nothing unusual occurred to damage or injure the plantations.

Description of Work.—The work during the year consisted of—

(*a.*) Watering young trees in nurseries.
(*b.*) Watering young trees on banks and bunds.
(*c.*) Planting out young trees.

Trees in nurseries and those which required watering on bunds and banks were watered. Except at canal chaukis the plantations consist of avenues along the different bunds and banks of canals.

The tabular statement shows clearly the lengths of the avenues on the different canals and bunds, as also the lengths planted out during the year under review.

The area planted out at each chauki is also given.

On account of there being no Foresters in the Division pruning has been neglected. It is worse than useless to attempt any pruning without a responsible man to look after the work. Pruning, however, seems to be badly required, and two Foresters ought to be attached to the Division if plantation operations are to be continued.

With the exception of requiring pruning the trees seem to be in a fairly thriving condition. There are, however, great numbers of trees in some of the nurser which are now toa large for planting out. This is due ot want of funds foxplanting them out.

The amount sanctioned for plantations for the year under report was about half the usual amount; and hence comparatively little planting out could be done. Some 3,300 young trees were planted on the different canals and embankments, as shown in the tabular statement.

Establishment.—The establishment employed consisted of 30 bhistis and 6 malis. The bhistis and malis were paid Rs. 6 per month. The work was as far as possible supervised by the sub-overseers.

Financial Results.—

Receipts.

		Rs.	A.	P.	Rs.	A.	P.
Sale of wood	...	2,002	0	0			
Do. grass	...	125	13	2			
					2,127	13	2

Charges.

		Rs.			
Pay of malis and bhistis	...	1,600			
Fencing, planting, &c.	...	778			
Add pay of Foresters for first seven months	...	379			
			2,757	0	0
Deficit Rs.			629	2	10

6.—Sirhind Canal, Main Line Division.

General Remarks.—For the present it is contemplated only to attempt "baráni" sowing, but out of the large areas available for sowing, there are many places where the spring level is high, and the general condition of soil and situation is favourable to the growth of tun and similar trees.

Kikar trees appear to thrive well when young, but to die in an unaccountable manner after attaining a fair size. The mulberry and the tali seem to thrive better than the kikar.

There are still large areas available for sowing, but it will only be attempted on the new spoil-banks and where the conditions are generally favourable: in the sandy sections nothing will be done until water is admitted into the canal.

Description of Work.—The "Maidan" at Rupar has been planted with different kinds of trees in avenues.

The spoil-banks of the first three miles were sown with kikar seeds, and the damaged trees in the chauki compounds replaced by new ones.

Establishment and Supervision.—Owing to the want of a good mali to superintend pruning and thinning operations, a large number of trees are being totally ruined. With the exception of the plantations in the first three miles, which are most flourishing, no chaukidars have been entertained to protect the trees, and there is every reason to believe that great damage has been done by zemindars breaking down branches of trees to feed their goats upon.

The best remedy appears to be in erecting wire-fencing in reasonable lengths, behind which a suitable hedge can be grown, and the plantations protected for a few years, when another length might be similarly protected by moving and erecting the old fencing.

Financial Results.—There has been no recorded income during the year. Beyond the expense of sowing, very little has been expended on the plantations.

7.—Sirhind Canal, 3rd Division.

General Remarks.—The year 1880-81 was an exceedingly bad one for the planting out of young trees and sowing seeds on spoil-banks, as, though the rain-fall was considerably in excess of the average for the year, yet its distribution was not favourable. The consequence was that many of the young trees planted out in July were burnt up in August.

Description of Work.—This has been confined to planting trees on the approaches of bridges and in the compounds of inspection bungalows, with the sowing of seed broadcast on the newly-made spoil-banks. An attempt was made to get up young trees on the spoil-banks, which had failed on previous occasions, by ploughing the land in ridges and dropping in seed of tali and kikar. Only about 28 acres out of over 300 sown germinated satisfactorily; and the Chief Engineer directed it should be stopped.

Establishment and Supervision.—No establishment, except bhistis during the hot months' is regularly kept. Nor, beyond a man occasionally employed in superintending the pruning and thinning out of young trees, is there any supervision beyond that necessarily given by the officer in charge of the sub-division of the Canal.

Financial Results.—

	Rs.
Receipts	*Nil.*
Expenditure	846
Deficit ...	486

8.—Sirhind Canal, 4th Division.

General Remarks.—The canals run through a very dry district, and arboriculture was found so costly that it was discontinued except in the case of new spoil-banks. The rain-fall during the year was abnormally scanty.

Description of Work.—The only work done during the year was the sowing of 40 acres of spoil-banks on the Abohar branch. Arrangements had been made to sow more, but, owing to the absence of rain, no more was done. All the seed sown failed to germinate.

Those avenues on the Sutlej navigation channel which are near wells (there are wells about 5 miles apart) are in a flourishing state; the trees are about 10 or 12 feet high, growing well; but elsewhere they are poor and stunted.

Establishment and Supervision.—There has been no regular supervision; such work as was done was performed by daily labour.

Financial Results.—

	Rs.
Receipts	*Nil.*
Expenditure	333
Deficit ...	333

9.—Sirhind Canal, 5th Division.

Blank.

10.—Western Jumna Canal, Karnal Division.

General Remarks.—The rain-fall has been ordinary. No special event to record other than that 13 young tun trees of three years' growth were destroyed on the Dadupur and Kharwan road by a maniac of Dadupur.

Description of Work.—Fifty-five trees were planted to fill vacancies on the Dadupur and Kharwan road. Fifty-two catulpa trees were raised at Dadupur from seed sown in May 1880. The young trees have been planted on the borders of the station and are flourishing, being on an average 3 feet high. In a few cases a growth of 12 inches in a month-and-a-half was observed. Forty young mango seedlings were grafted.

Siris	57
Tun	57
Tali	480
Bignonia	67
Mulberry	5
Simbal	76
Teak	10
Kachnar	43
Limes	2

In the Sumb plantation a total of 741 trees have been planted out, all of which are doing well at present. On the 25 acres sown last year, 30 per cent. of the seedlings failed. The siris and a portion of the tali failed; the kikar is thriving. Other work done consisted of watering and tending young trees and the mango gardens.

Establishment and Supervision.—The plantation work is done by malis (generally in constant employ), assisted by labourers engaged by the day according to the exigencies of the work in hand. There were three malis kept throughout 1880-81; one at Rs. 6, and two at Rs. 5 per mensem. The daily pay of labourers is 2½ annas. The supervision is entirely that of the Engineer staff. A Forester was attached to the division for the first five months of the year, when the office was abolished.

Financial Results.—

Receipts.

	Rs. A. P.	Rs. A. P.
Sale of wood	1,480 10 10	
Do. fruit	251 0 3	
		1,731 11 1

Charges.

Salaries (Foresters, 5 months)	187 8 0	
Do. malis and labourers, &c.... ...	686 1 3	
		873 9 3
Surplus ...		858 1 10

The principal revenue is by sales of wood; a great proportion of such sales are book adjustments on account of work going on in the division.

11.—Western Jumna Canal, Hansi Division.

General Remarks.—The Hansi Division, which consists of the Hansi canal, Butana, Darba and Bahadara branches, is well planted with trees of all descriptions. All the best available ground has been long ago taken up and planted, and is now covered for the most part with fine trees. There are, however, a few places where partial blanks occur, and which might be now treated. These places are on the spoil-banks, and they could, owing to the high level of the surface above water-mark, not be readily irrigated. It is proposed to trench these places and sow the edges with tali, mulberry, tun, &c. Water can then be run into the trenches from the canal, and the seed will germinate from the moisture which will

percolate upwards. Of late years planting out has been at a discount owing to the dread of damage done by the swarms of monkeys which abide on the canal. Probably the damaged done by them is less than that which accrues from cattle trespass, which it is impossible to prevent altogether.

Description of Work.—The Butana mango garden was maintained as usual, and a few grafts and Bombay mango plants imported from Saharanpur. Kikar was sown in several nurseries. It does not ordinarily require any nursing. A large quantity of fuel and timber was collected and sold, and part of the former was converted into charcoal, so as to lessen the cost of carriage.

Establishment and Supervision.—No special establishment has been maintained.

Financial Results.—

	Rs.
Receipts	6,177
Charges	2,552
Surplus ...	3,625

12.—Western Jumna Canal, Delhi Division.

General Remarks.—The banks of the old canal are in the main richly wooded, many fine trees dating back from half-a-century ago. These have afforded, and will still afford, considerable supplies of timber and fuel. In some cases an attempt was made to replace those trees which have died, or been cut down for timber and fuel; but, as pointed out in the report of last year, this has of late years had to be almost entirely abandoned on account of the damage caused by the innumerable monkeys. These have now increased until they have developed into a serious evil; not only putting a practical stop to arboriculture, but doing great injury to the adjoining crops. Until some measures are taken to reduce the numbers it is useless planting more trees. There are already many lengths quite bare, and it is to be feared the ultimate result will be the disappearance of these magnificent lines of trees.

Description of Work.—Between Joshi and Karona on the Rohtak canal, about 11 miles, 812 young trees were transplanted from canal nurseries in February and March, of which 703 are reported as having succeeded and being in good condition. A mali and mate are employed in looking after them, and it is hoped some fair proportion may be saved from monkeys till they get established.

It was intended to remodel the Najafgarh jhil drain, and no expenditure was consequently sanctioned for tanks. The water along most of the length is at some depth below the surface, and it would be costly planting out trees; but arrangements have been made for sowings of kikar in shallow trenches to replace the trees that have been cut down: also for plantations of willows near jhil itself.

Along a part of No. IX rajbaha the trees planted failed; in some cases owing to the presence of reh, and the length shown as planted requires renewal in places. About 300 jaman saplings were transplanted from nurseries, and are reported doing well.

The trees on the left bank of No. VII rajbaha are looking very well; a good many tali, mulberry and tun were planted out during the year, and there is now a continuous line for about 9 miles and a few others at intervals. There was a good deal of trouble in getting these started, and many had to be replaced. The following plan for watering was found to answer very well, *viz.*, putting in a single pipe at the crossing of the water-courses and leading the water by a shallow drain along the line of trees wherever feasible. The trees being no longer at the tender mercy of the bhisti, made rapid progress. Besides the trees from nurseries numbers of self-sown tali have been transplanted, and these are so far successful.

There are six mango gardens in the division which yield a fair profit to Government every year. Some additional trees were planted out during the year. Country mangoes, tali mulberry and other trees have been planted in some 30 chowki compounds.

Of nurseries there are three. Those at Israna and Sarag Thal contain a good number of well-grown seedlings. The operations of the year were confined to transplanting these seedlings along rajbahas and near chowkis. The one at Gangatoli has only just been laid out by sowing seed of tun, tali, jaman and mango, which are coming up very well.

Establishment.—Except malis at nurseries, no special establishment is entertained for this work. The charges shown being for daily labour, coolies, &c., employed from time to time as required.

Financial Results.—

	Receipts. Rs. A. P.	Rs. A. P.
Plantation—		
Sale of fuel ...	1,631 13 4	
Do. timber ...	1,658 9 5	
Do. fruit ...	511 14 0	
		3,802 4 9
Other canal produce.—Grass ...	502 5 1	502 5 1
Total Receipts		4,304 9 10

Expenditure.

		Rs.	A.	P.	Rs.	A.	P.
Sundry charges of maintaining—							
Plantation	...	525	0	0			
Total charges	...			...	525	14	6
Surplus	...			...	3,778	11	4

13.—Western Jumna Canal, New Delhi Branch Division.

General Remarks—The rain-fall of 1880-81 was an abnormal one. There was also continuous rain for 11 days in June 1880, and then no more till the middle of October. This affected the young trees a great deal. In consequence of the drought and the severe frost for two or three days in January, a large number of kikar trees especially were killed. Wherever it was possible, however, provision was made for watering from the water-courses which cross the new canals, and straw coverings were used during the cold weather to protect the young trees.

Description of Work.—Operations during the year were principally confined to tending the young trees transplanted or sown and maintaining the nurseries previously established. Experimental sowings of the *Reana luxurians* were made in March 1881 under directions received from the Superintending Engineer.

Although it has been hitherto found that the sowings on unirrigated land have been a comparative failure, no fair conclusion can at this stage of the growth be arrived at. It would appear, however, that the sowings should be made in the rains instead of in a comparatively dry month like March.

Establishment and Supervision.—The establishment consisted of one mali at Rs. 5 and a bhisti at Rs. 5 per mensem. When necessary extra malis, coolies and water-carriers were employed on daily labour. This establishment works directly under the executive staff of each sub-division.

Financial Results.—There have been no receipts, as the young trees have been only lately planted.

Expenditure.—The total expenditure for the year amounted to Rs. 303-80.

14.—Muzaffargarh Canal Division.

The Division was only constituted in April 1880, and no grant has yet been made for plantations. There are a great number of self-sown trees, chiefly tali, growing on the canal banks. There has not been time yet to have them counted.

At the request of the Deputy Commissioner a plantation was made along a new branch canal called the Wali Wah. The length selected was a desert tract of Government land covered with sand hills. On either side of the canal trenches were dug 2 feet deep and 2 feet wide for 6,000 feet. These trenches were well drenched with canal water and tamarisk stakes, 3 to 4 feet long, were planted in them at 5 feet intervals: not more than 100 stakes sprouted. They were put down in May, whereas it is believed that they should have been put in August and September.

In the last-named months about 900 tali and jaman trees were planted and seed sown in the trenches. Of the trees planted out, about 200 died, and the rest, owing to seasonable cold weather rains, are getting on very well. A good deal of the seed germinated also. The cost was defrayed from district funds, and a little less than Rs. 300 was spent. The deep-trench system was adopted for the following reasons:—

1*st.*—To get the roots of the trees well below the dry surface of the ground.

2*nd.*—To give a good drenching and to save the cost of re-making irrigating channels when gaps were filled up.

3*rd.*—As a protection against cattle out-grazing.

4*th.*—However bad the soil may be in those deep trenches, it gradually gets enriched by the clay sediment in the canal water.

15.—Swat Canal Division.

Blank.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
					I.—DELHI.					
					I.—Avenues.					
	Inches.	Inches.		Miles.	Miles.	Miles.	Miles.	Miles.		
Delhi ...	27	30	(1.) Delhi and Najafgarh road.	1	3	4	8	12	Siris, nim, gular, mulberry and different other kinds.	The young plants between 2 and 6 feet high are in flourishing condition.
			(2.) Road between Hamayún and Safdar Jang's tomb.	2	...	2	...	2	Nim, mulberry, pipal, tali and different other kinds.	Only vacant spaces replanted during the year.
			(3.) Nanglai and Najafgarh road.	3	4	7	...	7	Kikar sown in trenches.	Young plants in good condition.
			(4.) Azádpur, Bhagpat road.	11	...	11	...	11	Ditto ditto.	Young plants suffered from hot winds during the summer.
			(5.) Delhi and Gurgaon road up to Basant.	7	...	7	...	7	Ditto ditto.	Young plants in good condition.
			(6.) Road from Najafgarh *viâ* Palam to Basant.	10	...	10	...	10	Ditto ditto.	Ditto ditto.
			(7.) ChandniChauk road	...	1	1	...	1		
			(8.) Circular road ...	1	1	2	1	3		
			(9.) Esplanade road ...	...	1	1	...	1		
			(10.) Lothain road ...	...	...	...	1	1		

				(11.) Hamilton road ...	...	1	1	...	1			
				(12.) Mori gate road ...	...	...	...	...	...			
				(13.) Boulevard road ...	1	...	1	1	2	Tali, pipal, nim, mangoes and mulberry.	These are all municipal roads maintained by the Delhi Municipality.	
				(14.) Under hill road ...	1	...	1	...	1			
				(15.) Rajpur road ...	1	...	1	1	2			
				(16.) Ridge road ...	1	...	1	1	2			
				(17.) Alipur road ...	1	...	1	1	2			
				(18.) Roshanara road	1	...	1	...	1			
				(19.) Queen's road ...	...	...	...	1	1			
				(19A.) The Park ...	...	...	...	...	...	Jaman and tali plants.	Within the limits of Delhi Municipality.	
Sonepat	...	23	30	(20.) Sonepat and Bahalgarh road.	2	2	4	1	5	Siris, nim, gular, mulberry, tali, mangoes and different other kinds.	Generally in good condition.	
				(21.) Sonepat and Bhatgoan road.	7	...	7	...	7	Kikar sown in trenches.	Young plants suffered from hot winds during the summer.	
				(22.) Sonepat and Murthal road.	4	...	4	...	4	Ditto ditto.	Successful in about 3 miles at different places.	
				(23.) Sonepat and Jharut road.	10	...	10	...	10	Ditto ditto.	Young plants between 1 and 2½ feet.	
				(24.) Thana Kalan and Baghpat road.	17	3	20	...	20	Kikar and farash ...	Kikar sowings successful and in good condition. Farash plantations failed in about half a mile, owing to hot winds and frost.	
				(25.) Road from Sonepat to Grand Trunk road.	5	...	5	...	5	Kikar sown in trenches	The seeds have germinated and the young plants between one and three feet are in good condition.	
				(26.) Road from Delhi to Baghpat.	...	5	5	...	5	Farash about 200 ...	One-third of the plantation failed on account of hot winds, the rest was successful.	
				(27.) Rohat and Thana Khurd road.	3	...	3	...	3	Kikar ...	The sowings of kikar failed at about 2 miles in different places, the rest was successful.	
Ballabgarh	...	23	26	(28.) Road from Badarpur to Tuglakabad.	1	2	3	...	3	Siris, tali, mulberry and bakain.	The young plants between 2 and 5 feet high are in good condition.	

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued).

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
					I.—DELHI.					
					I.—Avenues.					
				Miles.	Miles.	Miles.	Miles.	Miles.		
			(29.) Road from Tuglakabad to Mathra road.	3	...	3	...	3	Kikar ...	Young plants between 2 and 3 feet high, and in good condition.
			(30.) Road from Tuglakabad to Mahrauli.	2	1	3	...	3	Kikar sown in trenches.	Young plants in good condition.
			(31.) Faridabad branch roads, north and south sides.	2	...	2	...	2	Ditto.	Strong and well grown trees between 5 and 15 feet high, and all in good condition.
			(32.) Faridabad and Majhaqli road.	9	...	9	2	11	Ditto.	Plants between 2 and 3 feet high, and generally in good condition.
			(33.) Ballabgarh and Chhaensa road.	5	...	5	7	12	Ditto.	Ditto ditto.
			(34.) Chhaensa and Sikri road.	2	...	2	9	11	Ditto.	Strong and well grown trees planted about 7 years ago.
			(35.) Ballabgarh branch roads, north and south sides.	...	...	...	...	...	Ditto.	Ditto ditto.
			(36.) Road in Fort compound.	...	...	...	...	...	Nim and siris ...	Old trees in good condition.
			Total Avenues ...	113	24	137	34	171		

				II.—Groves, Nurseries and Plantations.						
				Acres.	Acres.	Acres.	Acres.	Acres.		
Delhi ...	27	30	(1.) Delhi Bela plantation.	502	...	502	9	511	Nim, jaman, kikar, mulberry, willow cuttings and various other kinds.	A portion of the plantation was cleared of undergrowth during the year.
			(2.) Nurseries at Mubarik Bagh.	...	1	1	...	1	Tali, jaman, pipal, gular, mulberry, nim and different other kinds.	Three thousand plants between 4 and 6 feet high, supplied for transplanting during the year.
			(3.) Nursery at Tatarpur	...	...	...	...	...	Nim, pipal, tali, mulberry and different other kinds.	Some of the young plants suffered to some extent from the hot winds during summer.
			(4.) Nursery at Alipur	...	1	1	...	1	Jaman, pomegranates and mulberry.	In good condition.
			(5.) Planting in Police compound at Mahaldar Khan.	...	...	...	...	...	Different kinds of trees, chiefly nim, kikar, siris and pipal.	Nos. 5 to 13, 17 to 23, and 27 to 32 are all police chaukis. The particulars required by columns 5 to 9 cannot be given. The trees planted are all in good condition.
			(6.) Do. do. at Makharai Paick.	...	...	...	...	...		
			(7.) Do. do. at Nangli	...	...	...	...	...		
			(8.) Do. do. at Nathupur	...	...	...	...	...		
			(9.) Do. do. at Singhola	...	...	...	...	...		
			(10.) Do. do. at Tihar	...	...	...	...	...		
			(11.) Do. do at Serai Sita Ram.	...	...	...	...	...		
			(12.) Do. do. at Mundka	...	...	...	...	...		
			(13.) Do. do. at Tikri	...	...	...	...	...		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued).

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
				II.—Groves, Nurseries and Plantations. (—Contd).						
	Inches.	Inches.		Acres.	Acres.	Acres.	Acres.	Acres.		
Sonepat ...	23	30	(14.) Nursery on first mile of Sonepat and Ballabgarh road.	...	...	...	...	...	Siris ...	Plants very young, between 4 inches and 1 foot.
			(15.) Nursery on 3rd mile of Sonepat and Ballabgarh road.	...	...	...	...	...	Do. ...	Plants between 2 and 3 feet high.
			(16.) Nursery at Rai...	...	...	...	...	...	Do. ...	Ditto ditto.
			(17.) Planting in Police compound at Rai.	...	...	...	...	...		
			(18.) Ditto ditto at Kamashpur.	...	...	...	...	...		
			(19.) Ditto ditto at Murthal.	...	...	...	...	...	Different kinds of trees, chiefly nim, kikar, siris and pipal.	*Vide* remarks against No. 5. The trees are all in good condition.
			(20.) Ditto ditto at Bahabgarh.	...	...	...	...	...		
			(21.) Ditto ditto at Larsauli.	...	...	...	...	...		
			(22.) Ditto ditto at Garhi Kalan.	...	...	...	...	...		
			(23.) Ditto ditto at Barhi.	...	...	...	...	...		

Ballabgarh ...	22	26	(24.) Tilauri plantation	300	...	300	476	776	Kikar, willow cuttings, tali, beri and several other kinds.	No new trees were planted during the year, as the rakh is leased for grazing purposes.
			(25.) Nursery near the staging bungalow at Kutab.	...	...	...	...	...	Siris, tali and nim ...	Plants between 1 and 2 feet high.
			(26.) Ditto on 2nd mile of Badarpur Tughlakabad road.	...	...	...	...	...	Siris, tali, nim, kikar, and several other kinds, about 2,000.	More than three-fourths of the plants destroyed by wild rats.
			(27.) Planting in Police compound at Faridabad.	...	...	...	...	...	Different kinds of trees, chiefly nim, kikar, siris, and pipal.	*Vide* remarks entered against No. 5.
			(28.) Ditto ditto at Majhaoli.	...	...	...	...	...		
			(29.) Ditto ditto at Pul Burya.	...	...	...	...	...		
			(30.) Ditto ditto at Talab Kishen Dass.	...	...	...	...	...		
			(31.) Ditto ditto at Attah Bar.	...	...	...	...	...		
			(32.) Ditto ditto at Chhaensa.	...	...	...	...	...		
					II.—GURGAON.					
					I.—Avenues.					
				Miles.	Miles.	Miles.	Miles.	Miles.		
Gurgaon ...	30	17	Gurgaon to Sohna ...	13	...	13	2	15	Tali and nim ...	Fresh trees planted where required.
			Road to Railway Station	2	2	*4	...	4	Ditto ...	*A fresh row has been planted, thus showing 4 miles, instead of 2.
			Rord to Bahadargarh ...	4	...	4	1	5	Tali, nim and siris ...	Nearly all young trees. Katcha wells sunk.
			„ to Kutab ...	3	1	4	1	5	Tali and nim ...	Fresh trees planted instead of dead ones.
			Sohna to Palwal ...	5	...	5	2	7		
			Bahora to Taoru ...	1	1	2	4	6	Tali and nim ...	An out-of-the-way road. Soil not good and watering difficult.
			Farakhnagar to Railway	1	...	1	...	1	...	Mostly small trees protected by walls from cattle.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued).

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
	Average.	During the year.		*Planted.* In previous year.	*Planted.* During the year.	*Planted.* Total.	Unplanted.	Total length of road or area in miles.		
				II.—GURGAON.—(concluded.)						
	Inches.	Inches.		Miles.	Miles.	Miles.	Miles.	Miles.		
			Civil station roads ...	1	...	1	...	1	...	Trees in good order.
			On Jharsa bund ...	1	...	1	...	1	...	All old trees. Not requiring watering.
Núh ...	27	22	Núh to Ferozpur ...	3	1	4	5	9	Kíkar, siris, nim and talí.	1,952 trees, 470 planted during the year.
			Núh to Palwal ...	2	...	2	9	11	...	898 trees.
			Núh to Rewari ...	1	2	3	9	12	Kíkar sown broadcast	2,000 sprung up.
			Taoru to Bahora ..	2	4	6	...	6	Talí, siris, bakain & nim.	2,566 trees, 1,696 newly planted.
			Hathin to Palwal ...	...	1	1	5	6	Talí, siris and nim.	Kikar seed sown, 347 trees newly planted.
Palwal ...	29	22	Palwal to Sohna ...	6	...	6	5	11	Nim, talí and siris ...	2,049 trees standing.
			Palwal to Núh ...	3	...	3	3	6	Ditto.	Only 264 trees standing.
			Palwal to Hathin ...	...	2	2	3	5	Ditto, also pipal, gular, jaman, &c.	486 trees.
Ferozpur ...	23	23	Firozpur to Núh ...	2	1	3	11	14	Nim and farash.	
			Ditto to Alwar ...	...	2	2	6	8	Nim and talí.	
			Ditto to Jhirka Pass	1	...	1	2	3	Ditto.	
Rewari ...	20	21	Circular road ...	3	...	3	...	3	...	These two roads are under the Municipality.
			City to Railway ...	1	...	1	...	1	...	
			Total Avenues ...	55	17	72	68	140		

II.—Groves, Nurseries and Plantations.

					Acres.	Acres.	Acres	Acres.	Acres.		
Gurgaon	...	30	17	Civil station nursery ...	22	...	22	...	22		
Núh	...	27	22	Toaru nursery ...	...	...	...	...	...	Talí, siris and bakain.	Said to be 15,076 shoots, of which 10,300 were planted during the year.
				Nuh nursery ...	...	...	...	...	...	Nim, talí and siris ...	200 trees. 150 newly planted, 340 young trees planted on Núh to Ferozpur road from here.
Palwal	...	29	22	Nursery at 5th mile on Palwal to Sohna road	...	...	...	...	...	...	500 trees newly planted.
				Ditto. at 2nd mile ...	...	...	...	...	...	...	200 trees newly planted.
Ferozpur	...	23	23	Ferozpur nursery ...	1	...	1	...	1		

III.—KARNAL

I.—Avenues.

					Miles.	Miles.	Miles.	Miles.	Miles.		
Karnál	...	27	32	Karnál and Kaithal road	6	...	6	14	20	Mango, tali, siris, jaman, pipal, tút and kikar.	
				Do. towards Meerut...	3	...	3	3	6		
				Do. Do. Saharanpur	2	...	2	9	11		
				Do. Do. Hansi ...	2	...	2	16	18		
				Do. Do. Jagadhri...	6	...	6	11	17		
				Do. Do. Ferozpur	...	1	1	20	21		
				Indri and Thanesar road	2	...	2	6	8		
				Station roads ...	2	2	4	4	8		
Kaithal	...	19	29	Kaithal and Karnal road	1	...	1	17	18	Tali, siris and pipal.	
				Kaithal and Jhind road	3	...	3	26	29	Ditto ditto.	
				Deobundh & Asandh road	1	...	1	16	17	Ditto ditto.	
Pánipat	...	22	28	Pánipat and Sonauli road	5	4	9	1	10	Tali, siris, jaman, pipal, tut and kikar.	
				Pánipat and Barsat road	1	...	1	9	10	Ditto. ditto.	
				Grand Trunk Road to Kothi Pánipat ...	1	...	1	...	1	Ditto ditto.	
				Pánipat Rohtak ...	1	...	1	16	17	Ditto ditto.	
				Pánipat Kothi towards Karnál ...	2	1	3	...	3	Ditto ditto.	
				Pánipat tahsil towards city	1	...	1	...	1	Ditto ditto.	
Kaithal	...	23	28	Bedh Kidar Tank channel	...	...	...	4	4	Various kinds.	
				TOTAL AVENUES ...	39	8	47	172	219		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				II.—Groves, Nurseries and Plantations.						
	Inches.	Inches.		Acres.	Acres.	Acres.	Acres.	Acres.		
Karnal ...	27	32	Nursery at Karnal ...	...	...	...	...	8	Various kinds ...	4,000 seedlings and 178 big fruit trees.
			Grove at Gharanda ...	...	...	...	...	4		21 fruit trees.
			Encamping-ground Karnal ...	...	...	...	...	45	Nim, mango, pipal and siris. ...	
			Ditto Gharanda ...	...	...	...	...	63		
			Ditto Batana ...	...	...	...	...	62		
			Thana compound, bazar and tank at Batana ...	...	...	...	...	4		
			Dâk bungalow compound ...	...	...	...	...	3	Mango, nim and siris,	
			Police lines ...	...	...	...	...	6	Tali, &c. ...	
			Katcheri compound ...	...	...	...	...	10		
Kaithal ...	19	29	Nursery at Kaithal ...	...	...	...	...	...	Various kinds ...	Land private property,
Panipat ...	23	28	Do. at Panipat ...	...	...	...	...	1	...	1,000 seedlings.
			Encamping-ground Panipat ...	...	...	...	...	64	Tali, siris, &c.	
			Do. Sanbalka ...	...	...	...	...	44	Ditto.	

IV.—HISSAR.

I.—Avenues.

Hissar	...	20	14	Hansi to Hissar *viâ* Maheyar ...	Miles. 10	Miles. ...	Miles. 10	Miles. 1	Miles. 11	Tamarisk, kikar, siris, pipal, beri, jand, lislissa, tali, mulberry and bakain.
				Ditto *via* Raipur ...	11	...	11	...	11	Ditto ditto.
				Hissar to Bhiwani ...	2	...	2	6	8	Mulberry, kikar, siris, pipal and bakain.
				Hissar to Barwala ...	7	...	7	4	11	Ditto ditto.
Hansi	...	18	12	Hansi to Mahm ...	2	...	2	16	18	Mulberry, tali, bakain, pipal, kikar, nim and kamdu.
				Hansi to Hissar ...	2	...	2	4	6	Ditto ditto.
				Hansi to Bhiwani ...	6	...	6	12	18	Ditto ditto.
				Hansi to Karnal ...	1	...	1	19	20	Ditto ditto.
				Hansi to Barwala ..	1	...	1	14	15	Ditto ditto.
				Hansi to Tosham ...	1	...	1	11	12	Only kikar.
Bhiwani	...	19	17	Bhiwani to Hansi ...	1	...	1	6	7	Kikar, tamarisk and jand.
				Road outside Putram gate ...	...	...	...	...	...	Ditto ditto, tali and nim
				Circular road ...	4	...	4	...	4	Kikar, tamarisk and jand.
				Fendall bazar ...	...	...	...	...	...	Ditto ditto, and tali
Fatahabad	...	17	14	Fatahabad to Hissar ...	1	...	1	17	18	Tali, pipal, siris, nim, kikar, beri, gondni and mulberry.
				Fatahabad to Sirsa ...	1	...	1	9	10	Ditto ditto.
				From town to Delhi road	...	...	...	...	...	Tali, pipal, siris, nim and banyan.
				Do. to encamping-ground	...	...	...	...	...	Pipal, jal, kikar, tamarisk, jand, gondni and beri

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Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
	Inches.	Inches.		Miles.	Miles.	Miles.	Miles.	Miles.		
Barwala ...	16	18	Barwala to Hansi ...	...	...	...	7	7	Kikar, jal and jand.	
			Do. to Hissar ...	1	...	1	7	8	Ditto.	
			Do. to Tohana ...	1	...	1	23	24	Ditto.	
			Circular roads ...	1	...	1	...	1	Do. jal and tamarisk.	
Fatahabad ...	17	14	Banks of Rangoi Nala...	5	...	5	...	5	Kikar.	
			Total Avenues ...	58	...	58	156	214		
			II.—Groves, Nurseries and Plantations.							
				Acres.	Acres.	Acres.	Acres.	Acres.		
Hansi ...	18	12	Encamping-ground ...	2	...	2	...	2	Only kikar.	
Bhiwani ...	19	17	Ditto ...	27	...	27	...	27	Kikar, tamarisk, tali and nim ...	Groves.
Barwala ...	16	18	Grove on Hansi road ...	...	...	...	...	...	Kikar and tamarisk...	
Hansi ...	18	12	Nursery near encamping-ground ...	...	...	...	...	...	Kaindu, kikar, bakáin, tali, tamarisk, siris, and nim ...	Nurseries.
Barwala ...	16	18	Nursery on Tohana road	...	...	...	...	...	Kikar and tamarisk	
Do. ...	16	18	Do. on Hissar road	...	...	...	...	...	Ditto ditto ...	

Hissar	...	20	14	Station garden ...	7	...	7	...	7	Tamarisk, mulberry, kikar, siris, nim, tali, pipal, beri, bakain, lislissa, gular, tun, and amultas.	Plantations.
Do,	...	20	14	Park ...	7	...	7	...	7	Lemon, siris, kikar, bakain, banyan, pipal, farash, mulberry, nim, tali, beri and amultas.	

V.—ROHTAK.

I.—Avenues.

					Miles.	Miles.	Miles.	Miles.	Miles.		
Rohtak	...	21	17	Rohtak—Bhiwani road...	3	...	3	17	20	Tali, nim siris, farash and rohira.	
				Rohtak—Mehm road ...	4	...	4	19	23	Tali, nim, siris, mulberry, pipal, tamarisk, lasura and bakain.	
				Rohtak—Gohana road ...	3	...	3	7	10	Tali, nim, siris, mulberry, tamarisk, and lasura.	
				Rohtak—Delhi road ...	4	...	4	1	5	Tali, nim, pipal, siris, tamarisk, and lasura.	
				Rohtak—Jhajjar road...	4	...	4	4	8	Tali, nim, pipal, siris, mulberry and tamarisk.	
				Station roads ...	3	...	3	...	3	Tali, nim, pipal and siris.	
				Circular road ...	4	...	4	...	4	Tali, nim, siris ...	These figures are only approximately correct.
				Canal cut leading to Sadr	4	...	4	...	4	Tali, nim, pipal siris, mulberry, kikar, rohira, and lasora.	
				Rohtak—Sundarpur road	2	...	2	...	2	Tali, nim, siris, mulberry and tamarisk.	
Jhajjar	...	21	18	Rohtak—Jhajjar road ...	5	...	5	1	6	Tali and nim.	
				Jhajjar—Bhiwani road	1	...	1	5	6	Tali, nim, and tamarisk.	
				Jhajjar—Dadri road ...	1	...	1	9	10	Tali, nim, bakain.	

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Un-planted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
	Inches.	Inches.		Miles.	Miles.	Miles.	Miles.	Miles.		
Jhajjar ...	...	...	Jhajjar—Salhawas road	2	...	2	4	6	Tali, nim, bakain.	
			Jhajjar—Rewari road ...	1	1	2	12	14	Tali and nim ...	43 per cent. successful.
			Jhajjar—Farakhnaggar road ...	3	1	4	8	12	Tali and tamarisk ...	50 Ditto ditto.
			Jhajjar—Bahadurgarh road	2	...	2	4	6	Tali, nim and dhak.	
			Jhajjar—Kharkhauda road ...	1	1	2	3	5	Tali and tamarisk ...	95 Ditto ditto.
Samplá ...	24	22	Rohtak—Delhi road ...	8	...	8	16	24	Tali, nim, mulberry, tamarisk, siris, pipal, lasora, and kikar.	
			Jhajjar—Bahadurgarh road ...	2	1	3	8	11	Tali, nim, mulberry, siris, bakain and tamarisk,	85 Ditto ditto.
			Jhajjar—Kharkhauda road	4	...	4	16	20	Tali, nim, siris, pipal, tamarisk, kikar, rohira, and bakain.	
Gohana ...	23	23	Gohana—Panipat road ...	3	2	5	6	11	Ditto ditto. ...	29 Ditto ditto.
			Gohana—Butana road ...	2	...	2	4	6	Tali, kikar and jaman.	
			Mehm—Gohana road ...	5	2	7	4	11	Tali, nim, tamarisk, mango and jaman ...	66 Ditto ditto.
			Total Avenues ...	71	8	79	148	227		

II.—Groves, Nurseries and Plantations.

					Acres.	Acres.	Acres.	Acres.	Acres.		
Rohtak	...	21	17	10 Groves at different places.	9	...	9	...	9	Tali, siris, nim, pipal, kikar and kanair.	
				2 Nurseries ...	...	...	...	...	...	Tali, bakain, rahira, mango and kanair.	
Jhajjar	...	21	18	Police station ...	1	...	1	...	1	Tali and lasora.	
				Rest-house Jhajjar ...	12	...	12	...	12	Tamarisk tali.	
				Encamping-ground at Salhawas.	1	...	1	...	1	Tali and nim.	
Sampla	...	24	22	4 Groves in Sampla at different places.	27	15	42	...	42	Tali, nim, siris, kikar, tamarisk and mulberry.	
				4 Groves in Bahadurgarh at different places.	15	...	15	...	15	Siris, nim, tali, tamarisk, lasora, mulberry, pipal and bakain.	

VI.—SIRSA.

I.—Avenues.

					Miles.	Miles.	Miles.	Miles.	Miles.		
Sirsa	...	17	9	Delhi road from Sirsa to Pattidabar	2	...	2	12	14	Tali and nim ...	93 trees of the species stated were planted on 1½ mile in places which were blank; 33 died in consequence of scanty rain-fall.
				Main traffic road from Sirsa to Fazilka.	1	...	1	5	6	...	No trees were planted owing to the deficiency of rain.
				Abohar road from Sirsa to Bijjuwali	1	...	1	23	24	Tali and nim ...	On this one mile of the road 66 trees were planted in gaps; 17 died from insufficient rain-fall.
				Darba road from Sirsa to Darba	1	...	1	9	10	Ditto ...	Only 7 trees were planted in blanks, and they are said to be in a favourable state of growth.
Dabwali	...	15	12	Main traffic road towards Fazilka from Khyreka to Mahuwala.	44	...	44	...	44	Tali, pipal and ber ...	Gaps in several places of this road were filled up with 72 trees, of which 22 died from deficiency of rain.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued).

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Un-planted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
	Inches.	Inches.		Miles.	Miles.	Miles.	Miles.	Miles.		
Fazilka ...	16	9	Main traffic road towards Fazilka from Mahuwalla to Mauzzam ferry.	46	...	46	...	46	Kikar and beri ...	In filling blanks 50 trees were planted; none are said to have died.
			Total Avenues ...	95	...	95	49	144		
			II.—Groves, Nurseries and Plantations.							
				Acres.	Acres.	Acres.	Acres.	Acres.		
Sirsa ...	17	9	Nursery at Dhanur ...	1	...	1	...	1	Seeds of pipal, tali, nim, kikar, lemon, anar, and jaman sown.	This nursery supplies trees planted on road-sides of tahsils Sirsa and Dabwali. 885 trees came up this year, of which 280 having died, the remaining seedlings are said to be 2 feet high: of trees of other years still found in the nursery none exceed 8 feet high.

				Nursery in civil station, Sirsa	1	...	1	...	1	Seeds of pipal, tali and nim sown.	368 trees germinated this year, of which 110 died on account of an unfavourable rainy season.
				Groups of trees in village common ...	67	...	67	...	67	Pipal, tali and nim ...	The seedlings planted in village common lands were 280; of this number 90 died from drought.
Dabwali	...	15	12	5 Groups of trees on lands at Sohnwala, Odha, Pipli, Dabwali and Lambi encamping-grounds and staging-bungalows.	3	...	3	...	3		As the year was not favourable to the growth of trees, nothing was done to supplant the trees which died in these groups.
				Groups of trees in village common ...	80	...	80	...	80	Siris, ber, tali, pipal and lehsawa ...	200 trees are said to have been planted in these village common lands; owing to drought 150 of them died.
Fazilka	...	16	9	Plantation near tahsil at Fazilka ...	1	...	1	...	1	Seeds of pipal, beri, siris and kikar sown.	625 trees came up; 100 are said to have died and the others are stated to be in full growth: of the previous year's operations 6,000 trees are said to be in a thriving condition.
				5 Groves of trees on lands at Mauzzam, Mahtamnaggar, Alamshah and Ghurka dams of the Sutlej.	2	...	2	...	2	Beri, siris, pipal and kikar ...	100 trees were planted in these groups to fill up the gaps caused by the death of trees of previous years.

VII.—UMBALLA.

I.—Avenues.

					Miles.	Miles.	Miles.	Miles.	Miles.		
Umballa	...	3	38	Umballa and Pihewa road ...	...	5	5	9	14	Tali, siris, kachnar, mulberry, pipal and lasora.	3,415 trees planted, out of which 60 failed; rest successful.
Ditto	...	...	...	Ludhiana road ...	3	...	3	...	3	Tali ...	Blanks filled with 40 trees, of which 25 trees were successful.
				Umballa and Jagadhri road ...	22	...	22	...	22	Tali, mulberry, kachnar and pipal, &c.	Blanks filled with 354 trees, of which 178 trees were successful.
Ditto	...	...	...	Adhowa and Barara road	2	...	2	...	2	Tali, lasora and mulberry ...	Blanks filled with 50 trees, of which 20 trees were successful.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
	Inches.	Inches.		Miles.	Miles.	Miles.	Miles.	Miles.		
Umballa ...	...	...	Old Delhi road ...	2	...	2	...	2	Tali, siris, nim and pipal, &c.	Blanks filled with 114 trees, of which 97 trees were successful.
Ditto ...	...	...	Umballa City Railway Station road.	1	...	1	...	1	Tali and siris ...	Blanks filled with 52 trees, of which 32 trees were successful.
Ditto ...	...	...	Kalka junction road ...	...	...	...	...	...	Tali ...	Blanks filled with 28 trees, of which 17 trees were successful.
Ditto ...	...	...	Civil Line road ...	3	...	3	...	3	Tali and siris ...	Blanks filled with 155 trees, of which 87 trees were successful.
Ditto ...	...	...	Road joining kacheri road with Grand Trunk Road.	2	...	2	...	2	Tali ...	Blanks filled with 51 trees, of which 7 trees were successful.
Ditto ...	...	...	Sabathu road ...	1	...	1	...	1	Tali ...	Blanks filled with 40 trees, of which 26 trees were successful.
Ditto ...	...	...	Artillery Line road ...	3	...	3	...	3	Tali, siris and kachnar,	Blanks filled with 95 trees, of which 53 trees were successful.
Ditto ...	...	...	Road in front of Umballa Jail.	1	...	1	...	1	Tali ...	Blanks filled with 15 trees, of which 7 trees were successful.
Jagadhri ...	3	32	Kharwan road ...	4	...	4	...	4	Tali, siris and jaman...	Blanks filled with 139 trees, of which 134 trees were successful.

Jagadhri	...	...	...	Jagadhri circuit house road.	1	...	1	...	1	Tálí, siris and kachnár,	Blanks filled with 28 trees, of which 17 trees were successful.
Ditto	...	3	32	Abdullapur and Jagadhri road.	4	...	4	...	4	Tálí ...	Blanks filled with 12 trees, all successful.
Ditto	...	...	...	Jagadhri and Chhachrauli road.	...	2	2	4	6	Mango, jáman, siris and kachnár.	1,043 trees planted out, all successful.
Rupar	...	3	34	Rupar and Nalagarh road	7	...	7	...	7	Tálí, siris, mulberry and mango, &c.	Blanks filled with 830 trees, of which 727 trees were successful.
Do.	...	...	...	Umballa and Rupar road,	7	...	7	...	7	Tàlí, siris and jáman...	Blanks filled with 550 trees, of which 474 trees were successful.
Do.	...	...	...	Rupar and Morinda road,	12	...	12	...	12	Tálí, siris, mulberry and mango.	Blanks filled with 762 trees, of which 692 trees were successful.
Naraingarh	...	2	18	Nahan road ...	20	...	20	...	20	Tálí, siris and jáman...	Blanks filled with 1,410 trees, of which 700 trees were successful.
Pipli	...	3	39	Thanesar and Pipli road,	4	...	4	...	4	Tálí ...	Blanks filled with 400 trees, of which 193 trees were successful.
Do.	...	...	...	Pipli and Ladwa road ...	18	...	18	...	18	Tálí, kikar, lasora and kachnár.	Blanks filled with 2,092 trees, of which 682 trees were successful.
Do.	..	...	...	Indri road ...	4	...	4	...	4	Ditto ditto	Blanks filled with 69 trees, of which 19 trees were successful.
Kharar	...	3	37	Ludhiana and Kalka road,	19	...	19	...	19	Mango, jáman and mulberry.	All successful.
				TOTAL AVENUES ...	140	7	147	13	160		

VIII.—LUDHIANA.

I.—Avenues.

					Miles.	Miles.	Miles.	Miles.	Miles.		
Ludhiana	...	27	41	Kalka to Ludhiana ...	26	...	26	...	26	Tálí, siris, kikar and mulberry.	890 trees planted.
Jagraon	...	...	...	Ludhiana to Kotli ...	13	...	13	6	19	Ditto ditto	154 ditto.
				Dakha to Raekot ...	15	...	15	...	15	Ditto ditto	
				Sidhwan to Raekot ...	19	2	21	4	25	Ditto ditto	1,572 ditto.
				Kokri to Jagraon ...	4	...	4	...	4	...	
Samrala	...	27	41	Samrala to Machiwara	6	...	6	...	6	Tálí, siris, kikar and mulberry.	149 ditto.
				Samrala to Khanna ...	9	...	9	...	9	Ditto ditto.	157 ditto.
				TOTAL AVENUES ...	92	2	94	10	104		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				II.—Groves, Nurseries and Plantations.						
	Inches.	Inches.		Acres.	Acres.	Acres.	Acres.	Acres.		
Sadr	...	...	Ludhiana ...	2	...	2	...	2	Tali, siris, kikar and jaman.	5,000 trees planted.
Tahsil	...	...	Ditto ...	5	...	5	...	5	Ditto ditto.	1,000 ditto.
Jagraon	...	...	Bassian ...	5	...	5	...	5	Ditto ditto.	8,000 ditto.
				IX.—SIMLA.						
				No arboriculture in this district.						
				X.—JULLUNDUR.						
				I.—Avenues.						
				Acres.	Acres.	Acres.	Acres.	Acres.		
Jullundur ...	32	40	Jullundur to Nakodar ...	15	...	15	...	15	Tali and siris ...	Gaps and blanks filled up.
			Jullundur to Tanda Pakka.	5	2	7	12	19	Ditto.	
			Jullundur to Hoshiarpur, and to Jhandu Singha.	6	...	6	...	6	Ditto ...	Ditto ditto.
			Jullundur to Andrissa ferry on Sutlej in Ferozepore district *via* Kala and Lonyan.	6	...	6	25	31		

				Jullundur to Alawalpur	2	...	2	4	6				
				Do. Kapurthala	6	...	6	...	6		...	...	Under Public Works Department.
				Do. Nurmahal...	4	...	4	11	15		...		
				Do. Cantonment to Phagwara as far as Khajurla in this district.	2	...	2	...	2	Tali	...		Gaps and blanks filled up.
				Jullundur to Cantonment (Ladwal road).	3	...	3	...	3	Do.	...		Ditto.
				From Tanda road to City Railway Station.	1	...	1	...	1	Do.	...		Ditto.
				Adampur to Kartarpur *viâ* Alawalpur (Kacha).	2	...	2	11	13				
				Adampur to Sham in Hoshiarpur district.	2	...	2	2	4				
				From Nakodar road to Basti Shekh.	1	...	1	...	1	Do.	...		Ditto.
Nawashahr	...	30	33	Phagwara to Banga (Pakka)	12	...	12	...	12	Do.	...		Ditto.
				Banga to Rahon *via* Nawashahr (Kacha).	12	...	12	...	12	Do.	...		Ditto.
				Nawashahr to Jadlah (Simla road).	7	...	7	...	7	Do.	...		Ditto.
				Rahon to Jadlah (on Simla road).	2	...	2	5	7				
				Nawashahr to Garshankar,	4	...	4	...	4	Tali			
				Banga Ditto	2	1	3	3	6	Tali and tut.			
				Rahon to Phillour (*via* Aor.	12	...	12	...	12				
Phillour	...	21	46	Phillour to Nurmahal ...	13	...	13	...	13				
				Phillour to Raekot *via* Talwan and Bhandri ferry.	1	...	1	14	15				
				Nurmahal to Nakodar ...	7	...	7	...	7				
				Phillour to Samrai *via* Rurka.	3	...	3	12	15				

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
	Inches.	Inches.		Miles.	Miles.	Miles.	Miles.	Miles.		
Nakodar ...	30	49	Nakodar to Jullundur, pakka road.	15	...	15	...	15	Tâli ...	Gaps and blanks filled up.
			Nakodar to Shahkot *via* Malsian.	11	...	11	...	11	...	
			Nakodar to Sidhwan ferry *via* Mahatpur.	4	...	4	7	11	...	
			Total Avenues ...	160	3	163	106	269	...	
				II.—Groves, Nurseries, and Plantations.						
				Acres.	Acres.	Acres.	Acres.	Acres.		
			Plantation at Lisarah ...	13	17	30	...	30	Kikar.	
			„ at Sulkiana...	5	5	10	...	10	Do.	
			„ at Kirgana...	10	...	10	...	10	Kikar and tali ...	Gaps sown with kikar and tali seeds.
			„ at Chaula ...	13	10	23	...	23	Ditto.	
			„ at Panjdhera,	3	2	5	...	5	Kikar.	
			„ at Ramgarh,	5	6	11	...	11	Kikar and tali ...	Ditto ditto.
			„ at Nangal ...	3	...	3	...	3	Ditto.	
			„ at Gannapind,	10	4	14	...	14	Kikar and phulai.	
			„ at Mianwal,..	3	3	6	...	6	Kikar and tali.	
			„ at Moh ...	1	1	2	...	2	Tali.	

XI.—HOSHIARPUR.

I.—Avenues.

				Miles.	Miles.	Miles.	Miles.	Miles.	
Hoshiarpur	...	...	...	Hoshiarpur to Mangarh,	11	4	15	5	20	
				Hoshiarpur to Bullowal up to Chandehr.	9	3	12	2	14	
				Sham to Dholbaha *via* Hariana.	12	6	18	3	21	
				Hoshiarpur to Mehtiana,	9	2	11	2	13	Tálí and mango.
				Hoshiarpur to Hindowal,	6	3	9	3	12	
				Hoshiarpur to Chak Sadu,	4	2	6	2	8	
				Hoshiarpur to Adamwal,	2	...	2	...	2	
				Jian to Jaijon ...	1	1	2	...	2	
				Station roads ...	6	3	9	...	9	
Dusaya	...	...	...	Choulang to Nowshera *via* Tanda. Dasuya and Mukerian,	17	4	21	7	28	
				Kandhala to Srigobindpur *via* Tanda.	8	2	10	4	14	
				Tanda to Kandhali ...	1	1	2	1	3	
				Pulpukhta to Bhet ferry,	2	...	2	3	5	
				Dasuya to Rarra ...	2	...	2	12	14	
				Miani to Kolian ...	2	...	2	16	18	
				Mukerian to Mirthal ...	4	2	6	2	8	Tálí, gum-tree, jáman, mango, tún and phulái.
				Mukerian to Hajipur ...	4	1	5	4	9	
				Dasuya to Hajipur ...	9	...	9	5	14	
				Dasuya to Ramgarh *via* Dharampur.	2	...	2	21	23	
				Hajipur to Kach Khui,	15	1	16	4	20	
				Hajipur to Mirthal ...	1	...	1	7	8	
				Hajipur to Datarpur ...	1	...	1	4	5	
				Dasuya to tahsil buildings *via* Kaithan.	1	...	1	...	1	
				Dasuya to tahsil buildings *via* Mangarh.	3	1	4	1	5	

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				Miles.	Miles.	Miles.	Miles.	Miles.		
Garhshankar ...	...	...	Kot Fatuhi to Kothi Kangar.	9	3	12	2	14	Mango, jáman, táli, pipal, mulberry, bamboo, gum-tree and kikar.	
			Hindowal to Garhshanka	11	4	15	2	17		
			Garhshankar to Rupar ..	11	3	14	15	29		
			Ditto to Nawashar,	2	1	3	2	5		
			Ditto to Banga ...	2	2	4	1	5		
			Ditto to Nisarghat ...	13	...	13	...	13		
			Ditto to Kukowhal ...	14	...	14	...	14		
			Nisarghat to Rakran ...	8	...	8	...	8		
			Balachaur to Bhaddi Ghat.	8	...	8	...	8		
			Balachaur to Nawashahr,	4	...	4	...	4		
Una ...	...	...	Una to Hoshiarpur ...	7	...	7	5	12	Tali, mango, gum-tree, pipal, mulberry, bamboo, jaman, tun and kikar.	
			Do. to Anandpur...	4	...	4	8	12		
			Do. to Nagaha ...	2	...	2	2	4		
			Anandpur to Awankot,	2	1	3	10	13		
			Una to Jaijon ...	3	...	3	9	12		
			Do. to Amb ...	3	...	3	8	11		
			Do. to Sohan (to Nurpur).	4	...	4	16	20		
			Kalwan to Nurpur ...	...	3	3	6	9		
			Una to Nangal ...	2	2	4	4	8		

Amb	Amb to Gagret ...	2	1	3	1	4	Baid, tun, mango, jaman, tali, mulberry and phulai.		
	Mubarakpur to Anandpur,	3	1	4	4	8			
	Do. to Mandwara ...	1	2	3	9	12			
	Daulatpur to Nangnouli,	3	...	3	13	16			
	Jadla to Nahri ...	2	...	2	8	10			
	Daulatpur to Janrbar ...	1	...	1	5	6			
	Amb to Ambota ...	3	...	3	1	4			
	TOTAL AVENUES ...	256	59	315	39	554			
	II.—Groves, Nurseries and Plantations.								
		Acres.	Acres.	Acres.	Acres.	Acres.			
Hohiarpur	Encamping-ground at Gardiwala.	11	20	31	...	31	Tálí and mango.		
	Encamping-ground at Hariana.	23	10	33	...	33			
	Encamping-ground at Bullowal.	21	11	32	...	32			
	Encamping-ground at Mehtiana.	34	...	34	...	34			
Dasuya	Encamping-ground at Talwara,	2	...	2	5	7	Mulberry, táli, mango, &c., &c.		
	Encamping-ground at Hajipur,	3	...	3	6	9			
	Encamping-ground at Mukerian.	8	...	8	20	28			
	Encamping-ground at Dasuya.	11	...	11	22	33			
	Encamping-ground at Tanda.	7	1	8	25	33			
Garhshankar	Encamping-ground at Bharthala.	33	...	33	...	33	Mango, tali, jaman, bamboo, tun, pipal, ber, gum-tree, kikar, mulberry, phulai, anar, and kachnar.		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				Acres.	Acres.	Acres.	Acres.	Acres.		
Una ...	...	...	Encamping-ground at Una.	8	6	14	...	14	Mango, jaman, tali, and gum-tree.	
			Encamping-ground at Nurpur.	7	20	27	...	27		
Amb ...	...	...	Encamping-ground at Bharwain.	2	...	2	13	15	Mango, mulberry, tun, orange, tali and jaman.	
			Encamping-ground at Gagret.	2	...	2	3	5		
			Encamping-ground at Daulatpur.	3	...	3	2	5		
Hoshiarpur ...	...	...	Garden attached to Katchery Sadr.	1	...	1	...	1	Mango, gum-tree, tali, tun, apple, mulberry, &c., &c.	
			Garden attached to Mooris	10	...	10	...	10		
			Ditto Qanungoyan ...	4	...	4	...	4		
			Ditto at old jail ...	25	1	26	...	26		
			Ditto at tahsil ...	5	...	5	...	5		
			Ditto at Rarra ...	5	...	5	...	5		
Dasuya ...	...	...	Ditto at tahsil Dasuya,	4	...	4	1	5	Mango, tali, pipal, jaman, tun, mulberry, kikar and phulai, &c.	
Garhshankar ...	...	...	Jhiri at Dhumai ...	3	...	3	...	3		
Una ...	...	...	Ditto at Pandoga ...	...	...	...	...	...		

XI.—KANGRA.

Report not received on 1st October 1881.

XIII.—AMRITSAR.

I.—Avenues.

					Miles.	Miles.	Miles.	Miles.	Miles.			
Amritsar	...	32	22	Jandiala to Grand Trunk Road ...	3	...	3	...	3		731	
				Amritsar to Tarn Taran...	12	...	12	...	12		556	
				Ditto to Sialkot ...	9	...	9	13	22		262	
				Ditto to Majitha ...	4	...	4	7	11		115	
				Ditto to Fattehgarh...	11	...	11	3	14		350	
				Ditto Srigovindpur,	4	...	4	19	23		45	
				Fattehpur to Mahowka,	5	...	5	...	5	Tut, tali, siris, jaman	265	
				Wazir Bhuller to Batala,	4	...	4	9	13	nim, farash, &c.	120	Trees planted during the year.
				Amritsar to Ferozepore ...	1	...	1	16	17		50	
				Ditto to Gujranwala ...	9	...	9	13	22		1,157	
				Civil lines ...	18	...	18	...	18		993	
Tarn Taran	...	28	16	Tarn Taran, Gharenda,	2	...	2	17	19		30	
				Ditto Jandiala ...	2	...	2	7	9		25	
Ajnala	...	22	13	Ajnala to Atari ...	9	...	9	11	20		556	
				TOTAL AVENUES	93	...	93	115	208			

II.—Groves, Nurseries and Plantations.

					Acres.	Acres.	Acres.	Acres.	Acres.		
				Sadr plantation* ...	...	...	...	...	5	...	Fully stocked with young trees raised from seeds and cuttings, especially tali, mulbery, siris, ber, jaman, nim, tun, mango and kikar, &c.
				Chogowan plantation*...	...	...	...	...	1		
				Wazir Bhuller plantation	...	...	...	...	18		
				Tarn Taran plantation ...	...	...	...	...	1	Kikar ...	*These contain both full-grown trees and seedlings.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
				XIV.—GURDASPUR						
				I—Avenues.						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Gurdáspur ...	29	24	Road from Gurdáspur to Kalánaur.	15	...	15	...	15	200 talí ...	These roads are lined on both sides with grown-up trees. The arboricultural operations were confined to the filling-up of gaps on the first 4 or 5 miles.
			Road from Gurdáspur to Trimmu.	10	...	10	...	10	100 do. ...	
			Road from Gurdáspur to Naushera.	10	...	10	...	10	280 do. ...	
		A	Road from Gurdáspur to Bahrámpur.	7	...	7	...	7	220 do. ...	
			Road from Gurdáspur to Srigovindpur.	17	...	17	...	17	160 do. ...	
			Road from Gurdáspur Dínanagar.	6	...	6	...	6	220 do. ...	
			Old katcha road from Dínanagar to Trimmu	11	...	11	...	11	110 mango ...	
			Roads leading to dâk bungalow.	...	...	...	...	...	20 mango and 300 tali	Newly planted.
			Eight station roads.	6	...	6	...	6	286 talí, 56 mango and 43 jaman.	Splendid avenue.
		B	Road from Gurdáspur to Bamni.	2	...	2	...	2	...	Ditto, but no trees were planted on them during the year.
			Road from Bahrámpur to Mughlani Chak.	4	...	4	...	4		

				Road from Gurdáspur to Talibpur.	7	...	7	...	7	113 tali		A thin avenue, there being several breaks.
				Road from Dínanagar to Khal towards Narot.	2	...	2	...	2	...		
				Road from Bharámpur to Dínanagar.	5	...	5	...	5	...		
				Road from Talibpur to Dínánagar.	7	...	7	...	7	...		
				Road from Kalánaur to Bhagowala.	6	...	6	...	6	...		
			C.	Road from Kalánaur to Dera Nának near Shahpur.	2	...	2	...	2	...		Thin avenues.
				Road from Kanowán to Naushera.	6	...	6	...	6	...		
				Road from Kánáwán to Batála to tahsil boundary.	10	...	10	...	10	...		
				Road from butcher's shed to Naushera road.	2	...	2	...	2	...		
Batála	...	24	22	Road from Batála to Dera Nának.	18	...	18	...	18	190 mulberry, 24 drek and 33 mango.		
				Batála and Fatehgarh road.	16	...	16	...	16	160 mulberry and 10 drek.		
			A.	Road from tahsil to Anarkali.	1	...	1	...	1	10 mulberry.		Thick and shady avenues. All the gaps on the first 4 or 5 miles were filled up during the year.
				Road from Batala to Srigovindpur.	19	...	19	...	19	300 mulberry and 200 drek.		
			B.	Road from Batála to Pipli.	2	...	2	...	2			Ditto, ditto. But no trees were planted during the year.
				Road from Batála towards Wazir Bhuller.	10	...	10	...	10			
				Road from Batála to Bhet.	21	...	21	...	21			
				Road from Dera Nának to Fatehgarh.	12	...	12	...	12			
			C.	Road from Dera Nának to Kalánaur.	5	...	5	...	5	...		Thin avenues.
				Road from to Ramdas	2	...	2	...	2			
				Road from Fatehgarh to Ramdas.	54	...	54	...	54			

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				Miles.	Miles.	Miles.	Miles.	Miles.		
Pathankot ...	46	45	*A.* Pathankot and Mirthal road.	12	...	12	...	12	12 mango, 7 mulberry, and 13 tali.	Splendid avenues.
			Pathankot and Shahpur road.	8	...	8	...	8		
			Pathankot and Sujanpur road.	4	...	4	...	4		
		B.	Pathankot and Madhopur road.	6	...	6	...	6	...	Splendid avenues. No trees were planted during the year.
			Madhopur and Shahpur road.	5	...	5	...	5		
			Malikpur towards Shakargarh.	17	...	17	...	17		
			Sujanpur and Sherepur road.	7	...	7	...	7		
		C.	Shahpur and Nurpur road.	12	...	12	...	12	...	Thin avenues.
			Taragarh and Narot road.	10	...	10	...	10		
Shakargarh ...	53	34	Shakargarh and Chamal road.	9	...	9	...	9	200 tali, 100 mulberry, 50 kikar.	Splendid shady avenues.
		A	Shakargarh to Nurkot...	5	...	5	...	5	250 tali, 100 country mulberry & 200 kikar.	

			A.	Narkot and Mundikhel road.	7	...	7	...	7	300 tali, 100 China mulberry, 300 country mulberry, 100 drek and 115 kikar.	Splendid shady avenues.
				Shahgharib and Kotnaina road.	21	...	21	...	21	300 tali, 100 country mulberry, 100 drek, 125 kikar.	
			C.	Shakargarh and Ikhlaspur road.	12	...	12	...	12	200 tali, 100 China mulberry, 100 country mulberry, 100 drek.	Thin avenues.
				Narkot to Dorangla.	5	...	5	...	5	121 mulberry.	
				TOTAL AVENUES ...	435	...	435	...	435		
				II.—Groves, Nurseries and Plantations.							
					Acres.	Acres.	Acres.	Acres.	Acres.		
Gurdaspur ...	29	24		Government garden ...	28	...	28	...	28	100 peach, 100 orange and 100 loquat.	
				Sessions House garden...	19	...	19	...	19	150 alucha, 20 mango and 20 peach.	
				Mango garden ...	2	...	2	...	2	90 mango.	
				Tun garden ...	3	...	3	...	3	11 jaman.	
				Tali plantation ...	1	...	1	...	1	896 drek.	
				Serai garden ...	1	...	1	...	1	300 angur or vines, 50 bhi, 70 alúcha, 40 alu bukhara, 50 mango, 60 China mulberry and 30 orange.	
				Tahsil garden ...	1	...	1	...	1	130 China mulberry, 20 orange, 35 bhí and 75 pomegranates.	
				Encamping-ground garden	6	...	6	...	6	500 China mulberry, 200 tali and 140 drek.	
				China mulberry nursery	3	3	6	...	6	1,600 China mulberry,	Nursery.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued).

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
				Acres.	Acres.	Acres.	Acres.	Acres.		
Pathankot ...	46	45	Garden ...	2	...	2	...	2	103 orange, 18 graft mango, 42 peach, 12 amrud, 68 anar, 40 eluchas, 100 plantains, and 120 cuttings of rose.	
			Encamping-ground garden.	1	...	1	...	1	9 graft mango, 34 mulberry, 300 cuttings of mulberry, 120 cuttings of aluchas, 500 cuttings of rose, 100 cuttings of vine and 66 plantains.	
Shakargarh ...	53	34	Tahsil garden ...	...	...	...	...	...	50 China mulberry, 10 mango, and 2 Bombay mango.	
			Groves ...	...	...	...	...	...	600 tali.	

XV.—SIALKOT.

I.—Avenues.

				Miles.	Miles.	Miles.	Miles.	Miles.		
Sialkot	...	39	21	Gujranwala road ...	27	...	27	..	27	Chiefly mulberry ...	1,100 trees planted this year in gaps in 9 miles of this road.
				Bawa Lakhan Leper Asylum.	8	...	8	...	8	Mulberry and mango	Gaps filled up with 400 mulberry and 300 mango trees.
				Amritsar road ...	12	...	12	...	12	Ditto ...	675 mulberry and 40 mango trees in gaps in the avenues on both sides.
				Gurdaspur road ...	9	...	9	...	9	Mulberry, kíkar, talí, and bahíra.	Gaps in 4 miles of road filled with mulberry, kikar, tali and bahíra, 1,270 trees.
				Jummoo road ...	8	...	8	...	8	Mulberry, kíkar and talí.	Gaps in 2 miles filled with mulberry, kíkar and talí, 1,226 trees.
				Chaprár road ...	16	...	16	...	16	Kíkar and mulberry,	1,104 in gaps in 5 miles on both sides.
				Gondal road ...	9	...	9	...	9	Ber, kíkar, mulberry, tali and siris.	Planted gaps in 2 miles, 1,010 trees.
Pasrur	...	34	29	Amritsar road ...	12	...	12	...	12	Talí, kíkar, siris and mulberry.	185 tali, kikar, siris and mulberry, filling up gaps.
				Pasrur and Wazirabad road.	13	...	13	...	13	Talí ...	400 tali, filling up gaps.
				Pasrur to Gujranwala ...	13	1	14	4	18	Tali, &c. ...	One mile newly planted with 550 trees.
				Emnabad road ...	12	...	12	4	16	Mulberry, talí and kíkar.	200 trees planted in gaps.
				Wando to Wadala ...	6	...	6	3	9	Ditto ...	150 ditto ditto.
				Pasrur to Wadala and Daska.	7	...	7	...	7	Ditto ...	150 ditto ditto.
				Sialkot and Daska to Gujranwala.	4	...	4	...	4	Ditto ...	50 ditt ditto.
				Pasrur to Chawinda ...	2	...	2	...	2	Ditto ...	32 ditto ditto.
				Pasrur to Gurdaspur ...	3	...	3	2	5	Ditto ...	125 ditto ditto.
				Satrah to Kila Sobha Singh.	14	...	14	5	19	Tali and kikar ...	100 tali and kikar put down in gaps.
				Bhalowali to Satrah ...	2	...	2	2	4	Kikar, tali and siris ...	125 kíkar, talí and siris in gaps.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
				Miles.	Miles.	Miles.	Miles.	Miles.		
			Pasrur to Nonar ...	9	...	9	2	11	Mulberry and tali ...	125 mulberry and tali.
			Talwandi Musai Khan road.	8	...	8	...	8	Ditto ...	200 ditto ditto.
			Pasrur to Charwa and Othian.	2	...	2	1	3	Ditto ...	100 ditto ditto.
Raya ...	32	7	Doday and Lahore road,	34	...	34	8	42	Mulberry, tali, ber, siris and kikar.	2,563 trees planted in gaps in the avenues on both sides.
			Amritsar road ...	8	2	10	3	13	Kíkar, mulberry, bakain and tali.	1,992 trees planted in 2 miles on both sides.
			Mirakpur to Kila Sobha Singh.	6	...	6	...	6	Mulberry, tali, bakain and kikar.	2,520 trees planted in gaps.
Zafarwál ...	33	39	Dhamthal and Dera Nanak.	5	...	5	...	5	Kikar, mulberry, ber and phulahi.	1,058 gaps filled up.
			Zafarwál and Bajrah ...	16	...	16	...	16	Ditto ditto	358 ditto.
			Jummoo road ...	12	...	12	...	12	Ditto ditto	540 ditto.
			Total Avenues ...	277	3	280	34	314		

II.—Groves, Nurseries and Plantations.

				Acres.	Acres.	Acres.	Acres.	Acres.		
Sialkot Cantonment	...	...	District Fund garden ...	26	1	27	...	27		One acre added to the nursery; cuttings of various fruit and forest trees put down, including 1,000 cuttings of the Chinese mulberry.
Sialkot	...	...	Nursery at Dhera Sundha on the Amritsar road.	3	...	3	1	4	Tali, siris, bahera, mango and mulberry.	Quarter acre sown with tali, siris, bahera, mango and mulberry seeds.
Pasrur	...	...	Encamping-ground on Amritsar road.	...	...	1	1	1		One acre was sown in previous year, but several trees were left standing on the ground which could not be transplanted, they had grown too big. The ground has this year been cleared out, and will be sown next year.
			Nursery at Dhoda ...	...	...	1	1	1		Ditto ditto ditto.
			Do. at Talwandi on Amritsar road.	4	1	5	...	5		For the same reason as above one acre was cleared out last year, and the ground sown with seed. There are in the remaining 4 acres some 70,000 fine trees suitable for transplanting; next year another acre will be cleared.
			Tahsil garden, Pasrur ...	2	...	2	...	2		This garden has been well stocked with fruit and other trees, 150 trees were planted this year.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued).

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.[a]					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
					XVI.—LAHORE.					
					I.—Avenues.					
				Miles.	Miles.	Miles.	Miles.	Miles.		
Sharakpur ...	24	6	Road from Rajghat to Bhuchoke, Montgomery district.	10	1	11	31	42	Tali and siris.	
			Road from Sharakpur to Shekhupura.	2	...	2	13	15	Ditto.	
			Road from Sharakpur to Gaga.	2	...	2	10	12	Ditto.	
Chunian ...	27	15	Road from Mooltan and Ferozepur to Wanradharam and Veram.	6	2	8	25	33	Tali, siris, pipal and farash.	To the 4,224 trees which were planted in previous years on this road, 1,350 were added during the year. Both sides of the road are planted. The soil is sandy, and trees are reared with some difficulty. Almost all the tali trees planted have died. The soil is better suited for farash, and 1,175 of them have been planted. 1,225 trees were planted near wells along the road.

			Road from Chunian to Kanganpur.	3	...	3	13	16	Tali and farash	...	Miles 1 to 3 planted last year with 1,812 trees. The operations on this road this year were confined to replacing the trees of the previous year which died, 800 trees were thus planted.
			Road from Chunian to Hujra.	1	...	1	8	9	Ditto	...	Soil very bad, 100 trees were planted to fill up the gaps caused by deaths.
			Road from Chunian to Changa Manga.	8	1	9	...	9	Tali, kikar and pipal,		There are large shady trees on both sides of this road; 704 trees were planted this year in mile No. 5, and with success.
			Road from Chunian to Bhai Pheru.	1	1	2	16	18	Tali, farash and siris,		Trees on this road are watered by the canal rajbaha. Mile No. 15 was planted last year; and this year 1,500 trees were planted on mile No. 16.
Kasur	...	26	14 Road from Ganda Singhwala to Khudian.	5	1	6	8	14	Tali	...	600 trees were planted during the year in addition to 2,679 planted in previous years.
			Road from Khem Karn to Kasur.	6	...	6	...	6	Tali and farash	...	200 trees were planted in place of those that died.
			Road from Ganda Singh to Ferozepore and Amritsar	2	...	2	27	29	Kikar	...	Ditto ditto.
			Road from Huseni Khanwala to Kasur.	1	..	1	13	14	Farash.		
Lahore	...	31	11 Road from Meean Meer to Harike.	2	2	4	6	10	Tali	...	The soil is bad; 1,300 trees were planted during the year.
			Roads in Lahore.								
			Ferozepore road ...	...	1	1	...	1	60 tali	...	These trees were planted by the municipal establishment to fill up gaps in avenues on roads in the Civil Station.
			Bahawalpur road ...	...	1	1	...	1	104 do.	...	
			Upper Mall ...	...	2	2	...	2	53 do.	...	
			Church road ...	...	1	1	...	1	44 do.	...	
			Railway road ...	...	1	1	...	1	103 do.	...	
			Abbott road ...	...	1	1	...	1	51 do.	...	
			Montgomery road ...	...	...	...	...	...	61 do.	...	
			Miscellaneous roads and plots. ...	...	6	6	...	6	239 do.	...	
			TOTAL AVENUES ...	49	21	70	170	240			

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Un-planted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				XVII.—FEROZEPORE.						
				I.—*Avenues.*						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Ferozepore ...	1	17	1. Road from city Ferozepore to Zirah.	4	1	5	5	10	Tali, farash, kikar, ber, &c.	
			2. Ditto to Amritsar	2	...	2	...	2	Ditto.	
			3. Ditto to Makhu...	5	3	8	6	14	Ditto.	
			4. Ditto to Malwal...	6	1	7	...	7	Ditto.	
			5. Ditto Cantonment to Jhok.	2	1	3	1	4	Ditto.	
			6. Ditto City to Khal	5	1	6	...	6	Ditto.	
			7. Ditto Cantonment to Khal	5	1	6	...	6	Ditto.	
			8. Ditto City to garden	4	1	5	...	5	Ditto.	
			9. Ditto Cantonment to Zirah.	3	1	4	8	12	Ditto.	
			10. Ditto City to Ghat	4	...	4	...	4	Ditto.	
			11. Ditto Cantonment to Ghat	7	...	7	...	7	Ditto.	
			12. Ditto ditto to Malwal	3	...	3	...	3	Ditto.	
			13. Race-course ...	4	...	4	...	4	Ditto.	

			14. Road from bridge near Jail garden to bridge on Grand Trunk Road near grave-yard.	2	...	2	...	2	Tali, farash, kikar, ber, &c.		
			15 From Cantonment to Miran Shahneer.	6	1	7	...	7	Ditto.		
			16. Road from Khai to Bhura.	1	1	2	10	12	Ditto.		
			17. Road from Peyarava to Mudki.	10	...	10	...	10	Ditto.		
			18. Road from Khai to Mamdot.	1	1	2	6	8	Ditto.		
Zirah	...	13	19	1. Road from Nithanah to Kawan.	8	...	8	5	13	Kikar and beri.		
				2. Road from Ferozepore to Kishenpurah.	38	...	38	...	38	Ditto.		
				3. Ditto to Indresah...	17	...	17	...	17	Ditto.		
				4. Road from Harriki ferry to Lohara.	26	...	26	...	26	Ditto.		
				5. Ditto ditto to Kakri ..	26	...	26	...	26	Ditto.		
				6. Ditto ditto to Faridkot	23	...	23	...	23	Ditto.		
				7. Road from Mogah to Zirah.	16	...	16	...	16	Ditto.		
				8. Road from Kot Isa Khan to Data.	8	...	8	...	8	Ditto.		
Mogah	...	11	13	1. Road from Nithanah to Bagapuranah.	1	...	1	38	39	Tali and farash.		
				2. Road from Harriki to Himatpura.	8	...	8	16	24	Ditto.		
				3. Road from Bagapuranah to Kot Kapura.	4	...	4	8	12	Ditto.		
				4. Ditto Khosa to Mogah	2	...	2	4	6	Ditto.		
				5. Road from Bagapuranah to Ludiana border,	2	...	2	4	6	Ditto.		
Muktsar	...	1	17	1. Road from Pindi to Pamba Vattoo.	19	3	22	3	25	Tali, farash, beri, &c.		
				2. Road from Muktsar to Man Singhwala.	11	2	13	...	13	Ditto.		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Un-planted.	Total length of road or area in miles.		
				Miles.	Miles.	Miles.	Miles.	Miles.		
			3. Road from Muktsar to Bhataiyanah.	15	1	16	2	18	Tali, farash, beri, &c.	
			4. Ditto ditto to Bagekhi.	16	5	21	...	21	Ditto.	
			5. Ditto ditto to Kuraiwala.	10	4	14	...	14	Ditto.	
			6. Ditto ditto to Saraimanga.	7	3	10	...	10	Ditto.	
			7. Road from Jalalabad to Mokamarain.	...	20	20	...	20	Ditto.	
			Total Avenues ...	331	51	382	116	498		
				II.—Groves, Nurseries and Plantations.						
				Acres.	Acres.	Acres.	Acres.	Acres.		
Ferozepore ...	1	17	20 groves or plots ...	91	1	92	58	150		
Zirah ...	13	19	16 Ditto. ...	54	3	57	88	145		
Mogah ...	11	12	58 Ditto. ...	89	...	89	...	89		
Muktsar ...	1	16	10 Ditto. ...	7	4	11	26	37		

XVIII.—GUJRANWALA.

I.—Avenues.

				Miles.	Miles.	Miles.	Miles.	Miles.		
Gujranwala ...	25	14	Gujranwala to Hafizabad road.	15	8	23	1	24	Tali and siris ...	Blanks filled with 2,500 trees. Success.
			Gujranwala to Ramnaggar road.	9	...	9	...	9	Ditto. ...	Gaps filled with 500 trees Success.
			Gujranwala to Batala road	5	...	5	8	13	...	Operations confined to the maintenance of old trees.
			Ditto to Kila Mian Singh road.	2	...	2	22	24	Tali and siris ...	Blanks filled with 100 trees. Success.
			Gujranwala to Naushera road.	4	1	5	19	24	Ditto. ...	Planted with 200 trees. Success.
			Gujranwala to Khiali road.	3	...	3	...	3	...	Operations confined to the maintenance of old trees.
			Gujranwala to Sialkot road.	6	...	6	1	7	...	Gaps filled with 250 trees.
			Gujranwala to Shekhupura or Majjuchak.	...	8	8	16	24	Tali and siris ...	Planted 4,860 new trees. Success.
			Gujranwala to Nangal Dunna Singh *via* Eminabad.	8	...	8	10	18	...	Operations confined to the maintenance of old trees.
			Circular road ...	2	...	2	...	2	Kikar, phurwan & tali.	50 blanks filled. Success.
Wazirabad ...	26	17	Wazirabad to Ramnaggar.	14	1	15	12	27	Tali and siris ...	Gaps filled with 500 trees. Partial success.
			Wazirabad to Kalaske...	1	...	1	10	11	...	Operations confined to the maintenance of old trees.
			Ditto to Daska ...	4	...	4	1	5	...	Ditto ditto.
			Ditto to Dhonkal ...	1	...	1	3	4	...	Ditto ditto.
			Ditto to Ramnaggar	1	...	1	14	15	...	Ditto ditto.
Hafizabad ...	21	17	Hafizabad to Gujranwala *via* Chak Chatta	3	1	4	4	8	Kikar, phurwan and tali.	1,000 trees. Partial success owing to inferior soil.
			Hafizabad to Gujranwala *via* Bhiri Shah Rahman.	1	...	1	7	8	...	Operations restricted to the maintenance of old trees owing to bad soil.
			Hafizabad to Shekhupura	1	...	1	29	30	...	Ditto ditto ditto.
			Ditto to Ghari Awan	1	...	1	...	1	...	Ditto ditto ditto.
			Jalalpur to Pindi Bhatian	1	...	1	5	6	...	Ditto ditto . ditto.
			TOTAL AVENUES ...	82	19	101	162	263		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				II.—Groves, Nurseries and Plantations.						
				Acres.	Acres.	Acres.	Acres.	Acres.		
Hafizabad ...	21	17	Nursery at Mutteke ...	1	...	1	...	1	Siris, ber and phurwan.	Operations were confined to the maintenance of old trees.
			Ditto at Darahwala on Gujranwala and Hafizabad road.	...	...	...	...	...	...	Ditto ditto ditto.
			Nursery at Hafizabad	...	...	...	...	...	Tali ...	Planted 300 trees. Success.
Gujranwala ...	25	14	Nursery at Killa Rai Singh.	...	...	...	...	...	Ber, kikar, drek, siris and tali.	Success.
			Nursery at Kulewala ...	...	...	...	...	...	Ditto ditto.	Ditto.
			Do. at Ratali ...	...	...	...	...	...	Ditto ditto.	Ditto.
			Do. at Mahal ...	...	...	...	...	...	Ditto ditto.	Ditto.
			Do. at Mandianwala	...	...	...	...	...	Ditto ditto.	Ditto.
			Do. at Begpur ...	...	...	...	...	...	Ditto ditto.	Ditto.
			Planting trees round new tahsil.	4	...	4	...	4	...	Operations were confined to the maintenance of old trees.

XIX.—RAWALPINDI.

I.—Avenues.

				Miles.	Miles.	Miles.	Miles.	Miles.	
Rawalpindi	...	34	20	Road from Tulsa to Sud	14	...	14	2	16	Tali and phulai.
				Gorackpur to Banda ...	7	...	7	4	11	Ditto.
				Ferazi to Chak Budal ...	1	...	1	1	2	Ditto.
				Riwát to Kurimaliaran...	14	...	14	2	16	Ditto.
				Do. to Sukho ...	8	...	8	2	10	Ditto.
				Alum Shere to Bantallian	2	...	2	1	3	Ditto.
				Riwat to Ramial ...	4	...	4	1	5	Ditto.
				Kotha Kalan to Nara Saidan.	7	...	7	3	10	Ditto.
				Katcheri Sadr to Khana Dak.	4	...	4	...	4	Ditto.
				Rawalpindi to Had Narai	11	...	11	7	18	Ditto.
				Chera to Tamair ...	2	...	2	4	6	Ditto.
				Rawalpindi to Kuri ...	5	...	5	2	7	Ditto.
				Simbal Karak to Nurpur	3	...	3	1	4	Ditto.
				Saidpur to Nurpur	1	...	1	2	3	Ditto.
				Rawalpindi to Saidpur	8	...	8	1	9	Ditto.
				Do. to Chúhbar ...	3	...	3	...	3	Ditto.
				Do. to Kuhram ... Gujar.	6	...	6	8	14	Ditto.
				Jhangi Saidan to Nasaralla.	1	...	1	5	6	Ditto.
				Pind Sangral to Grand Trunk Road.	3	...	3	2	5	Ditto.
				Sangjáni to Wani ...	1	...	1	4	5	Ditto.
				Sarai Kála to Thatta Khalil.	2	...	2	5	7	Ditto.
				Peshawal to Dalla ...	6	1	7	10	17	Ditto.
				Katcheri to Mehra Khurd	6	2	8	4	12	Ditto.
				Ráwalpindi to Khassalla Kela.	5	2	7	5	12	Ditto.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued).

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Un-planted.	Total length of road or area in miles.		
				Miles.	Miles.	Miles.	Miles.	Miles.		
Attock ...	...	....	Gondal to Hazro No rain-gauge kept here.	8	...	8	...	8	Tali and phulai ...	There are no avenues on the side of this road, but only 1,102 trees are planted here and there. The length of road remaining unplanted cannot therefore be given.
			Saidan to Hazro ...	3	...	3	...	3	Ditto ...	There were 99 trees only on this road.
			Saidan to Usman ...	9	...	9	...	9	Ditto ...	469 trees exist on this road.
Fatehjang ...	...	...	Fatehjang to Johad ...	3	2	5	4	9	Tali, phulai and drek.	
			Gari Hashu to Pind Bahadur.	4	3	7	1	8	Ditto ditto.	
			Fatehjang to Kalla Pari,	15	3	18	11	29	Ditto ditto.	
			Fatehjang to Chakri ...	15	1	16	...	16	Ditto ditto.	
			Hun to Rarotra ...	12	3	15	...	15	Ditto ditto.	
			Chahan to Dhadhamber,	7	8	15	...	15	Ditto ditto.	
			Fatehjang to Dhurnal ...	4	2	6	4	10	Ditto ditto.	
			Munjial to Bajal ...	2	4	6	3	9	Ditto ditto.	
			Dandi to Dhadhamber...	2	1	3	...	3	Ditto ditto.	

Gujar Khan	Gujar Khan to Bagam ..	15	1	16	5	21	Tali, phulai and drek.				
	Kazian to Narali Keswal,	1	...	1	...	1	Ditto	ditto.			
	Bagam to Chak Land ..	2	...	2	...	2	Ditto	ditto.			
	Tank Mirza to Chakral	7	...	7	...	7	Ditto	ditto.			
	Kanhial to Narali ...	3	...	3	2	5	Ditto	ditto.			
	Banjial to Irozi Chahar	4	1	5	...	5	Ditto	ditto.			
	Mundra to Bhatta Mallial	3	2	5	...	5	Ditto	ditto.			
	Gujar Khan to Pahote...	10	5	15	4	19	Ditto	ditto.			
	Tank Loharar to Banda,	1	...	1	1	2	Ditto	ditto.			
	Mauza Jangal to Behar Rathial.	3	...	3	1	4	Ditto	ditto.			
	Sura to Sakho ...	2	2	4	2	6	Ditto	ditto.			
	Sakho to Taragarh ...	2	...	2	2	4	Ditto	ditto.			
	Mandra to Turkwal ...	10	3	13	9	22	Ditto	ditto.			
	Sherekhan to Murree Kallial.	9	2	11	...	11	Ditto	ditto.			
	Gujar Khan to Missa ...	7	...	7	...	7	Ditto	ditto.			
Kahuta	Kahuta to Guzar Owen...	7	1	8	3	11	Ditto	ditto.			
	Bewar to Kallar ...	13	2	15	5	20	Ditto	ditto.			
	Kallar to Dangally ...	10	1	11	2	13	Ditto	ditto.			
	Dangally to Gujar Khan,	4	1	5	1	6	Ditto	ditto.			
	Kallar to „ ...	2	...	2	1	3	Ditto	ditto.			
	„ to Mangura ...	2	...	2	...	2	Ditto	ditto.			
	„ to Mandroo ...	3	1	4	1	5	Ditto	ditto.			
	„ to Riwát ...	8	1	9	1	10	Ditto	ditto.			
	„ to Saligram ...	14	1	15	2	17	Ditto	ditto.			
	Saligram to Nara ...	5	1	6	1	7	Ditto	ditto.			
	Kahuta to Mandra ...	9	1	10	4	14	Ditto	ditto.			
	„ to Saligram ...	2	...	2	19	21	Ditto	ditto.			
	„ to Muttor ...	6	1	7	1	8	Ditto	ditto.			
	„ to Rawalpindi ...	5	1	6	2	8	Ditto	ditto.			
	Chenam to Jhoa ...	3	...	3	2	5	Ditto	ditto.			
	Kutcherry Kahuta to school-house at Kahuta. ...	1	...	1	...	1	Ditto	ditto.			
	Road round Kahuta ...	1	...	1	1	2	Ditto	ditto.			
	TOTAL AVENUES ...	382	60	442	171	613					

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				XX.—JHELUM.						
				I.—Avenues.						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Jhelum ...	23	15	Dulial road ...	1	1	2	4	6	Tali.	
			District kutcherry to Kala.	2	1	3	...	3	Do.	
			Jhelum city to Kala ...	3	1	4	...	4	Do.	
			Dam near Jhelum city near new mohalla.	...	...	...	...	...	Do.	
			Railway station cross-road.	...	...	...	...	...	Tali and tallow trees.	This cross-road is being planted to screen latrines.
Pind Dadan Khan...	16	16	Pind Dadan Khan *vid* Choya Saidan Shah to Dalelpur.	35	3	38	4	42	Kikar, bakain and tali.	
Chakwal ...	14	17	Various roads ...	...	...	...	...	...	...	146 trees were planted on various roads, which succeeded well.
Talagang ...	16	21	Talagang to Kalabagh,	35	...	35	7	42	Tali, bakain and kikar.	
			Ackwal to Lawa ...	25	1	26	5	31	Ditto ditto.	
			Talagang towards Pind Dadan Khan.	2	1	3	3	6	Ditto ditto.	
			Total Avenues ...	103	8	111	23	134		

				II.—Groves, Nurseries and Plantations.						
				Acres.	Acres.	Acres.	Acres.	Acres.		
Jhelum ...	...	...	Public garden ...	...	...	...	...	...	...	5,200 trees, of which 1,800 died.
Pind Dadan Khan ...	...	...	Ditto ...	...	...	...	...	...	...	1,000 trees, of which 200 failed.
Chakwal ...	...	...	Ditto ...	...	...	...	...	...	...	500 trees, of which 250 failed.
			Jhoa Bhadur plantations	...	...	...	...	...	Tali.	
			Bal Bikhari „	...	...	...	...	...	Do.	
			Mari „ ...	...	1	1	...	1	Do.	
			Dhalabi „ ...	...	...	...	...	...	Do.	
Talagang ...	...	...	Dam at Talagang ...	...	...	...	...	...	Do.	
				XXI.—GUJRAT.						
				I.—Avenues.						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Gujrat ...	32	16	Gujrat towards Bhimber,	18	6	24	...	24		
			Loop road to the Gujrat Railway Station.	1	...	1	...	1	Tali and kikar ...	Tali trees have been planted where necessary in gaps.
			Circular road close to sadr district building Gujrat,	1	...	1	...	1	Tali ...	Ditto ditto ditto.
			Gujrat towards Phalia...	1	1	2	...	2	Tali ...	Ditto ditto ditto.
			TOTAL AVENUES ...	21	7	28	...	28	Tali and kikar ...	Ditto ditto ditto.
				XXII.—SHAHPUR.						
				I.—Avenues.						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Shahpur ...	16	12	Road leading to Kachewala ferry.	...	3	3	1	4	Kikar, mulberry and tali.	
			End of Lahore and Shahpur road	...	1	1	...	1	Ditto ...	No other portion of this road is suited for tree-planting.
			TOTAL AVENUES ...	...	4	4	1	5		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				II.—Groves, Nurseries and Plantations.						
				Acres.	Acres.	Acres.	Acres.	Acres.		
Shahpur ...	...	...	Plot near stallion stables,	...	1	1	...	1	Kikar, mulberry and tali.	
			Ditto kacha tank,	...	1	1	...	1	Ditto.	
			Kutcherry compound ...	...	...	...	...	...	Fig.	
Bhera ...	14	14	Encamping-ground at Chak Ramdas.	...	15	15	...	15	Kikar and tali.	
			Encamping-ground at Bhera	...	10	10	...	10	Ditto.	
Khushab ...	12	7	Plot near serai at Khushab,	...	1	1	...	1	Ditto.	
			Ditto at Nurewala,	...	1	1	...	1	Ditto.	
			Banks of Corbynwah canal,	...	3	3	...	3	Ditto.	
				XXIII.—MOOLTAN.						
				I.—Avenues.						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Mooltan ...	8	6	Mooltan and Bahawalpur road.	3	...	3	21	24	Tali, siris, mulberry, kikar, pipal, bohar, jaman and nim.	101 trees more planted during the year, making a total of 242.

			Mooltan & Shujabad road,	4	...	4	12	16	Tali siris, mulberry, kikar, pipal, bohar, jaman and nim.	206 more trees planted during the year, making a total of 363 trees.	
			Mooltan and Bandarghat road.	3	...	3	2	5	Ditto ditto.	136 do.	do. do. do. 440 do.
			Sher Shah road near staging bungalow.	1	...	1	11	12	Ditto ditto.	47 do.	do. do. do. 65 do.
Shujabad ...	12	3	...			*Nil.*					
Lodhran ...	8	3	Lodhran and Jalalpur road.	12	...	12	12	24	Tali, pipal, kikar, ukhan, bakain, siris and bohar.	305 do.	do. do. do. 950 do.
			Old Customs line ...	20	...	20	27	47	Tali, pipal, kikar, ber, bakain, siris and bohar.	628 do.	do. do. do. 901 do.
			Kalluwala and Shujabad road.	4	...	4	10	14	Siris, tali, pipal and kikar.	175 do.	do. do. do. 256 do.
			Mooltan and Bahawalpur road.	8	...	8	15	23	Ber, siris, tali, bakain, kikar, ukhan, pipal and bohar.	231 do.	do. do. do. 587 do.
			Kehror and Lodhran road,	5	...	5	2	7	Siris, tali, bohar, pipal and kikar.	220 do.	do. do. do. 391 do.
Mailsi ...	3	7	Mailsi and Mooltan road *via* Tibba.	11	...	11	17	28	Pipal, bohar, tali, kikar, siris and ber.	201 do.	do. do. do. 467 do.
			Mailsi and Jun Thal road.	6	...	6	26	32	Ditto ditto ...	63 do.	do. do. do. 74 do.
			Luddan and Sarai Sidhu road.	1	2	3	30	33	Tali and bohar ...	18 do.	do. do. do. 60 do.
			Karmpur and Tibba road.	8	...	8	30	38	Kikar, tali, siris and ber.	10 do.	do. do. do. 40 do.
			Kotla Naranjan and Dhanot road.	7	...	7	2	9	Ditto ditto ...	227 do.	do. do. do. 257 do.
			Mailsi and Kotla Naranjan road.	18	...	18	6	24	Pipal, tali, bohar, kikar and siris.	356 do.	do. do. do. 459 do.
Sarai Sidhu ...	7	3	Tahsil to city of Sarai Sidhu.	...	...	...	...	...	Tali, kikar and ber ...	58 do.	do. do. do. 68 do.
			TOTAL AVENUES ...	111	2	113	223	336			

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				II.—Groves, Nurseries and Plantations.						
				Acres.	Acres.	Acres.	Acres.	Acres.		
Mooltan ...	...	...	...			*Nil.*				
Shujabad ...	...	...	...			*Nil.*				
Lodhran ..	8	3	Lodhran plantation ...	2	...	2	...	2	Tali, siris, mango, pipal and bohar.	300 trees planted during the year; total 1,541 trees.
			Jalalpur plantation ...	1	...	1	...	1	Tali, siris, bakain and pipal.	250 do. do. do. do. 830 do.
Mailsi ...	3	7	Mailsi plantation ...	1	...	1	...	1	Pipal, bohar, tali and siris.	2,630 cuttings of trees planted in places of those transplanted to road sides, of these 1,190 died.
			Tibba plantation ...	1	...	1	...	1	Ditto ditto ...	465 ditto ditto, of these 177 died.
			Kehror plantation ...	1	...	1	...	1	Ditto ditto ...	1,235 ditto ditto, of these 177 died.
			Pakhi Mian ...	...	...	...	...	...	Ditto ditto ...	290 ditto ditto, of these 180 died.
Sarai Sidhu ...	7	3	Sarai Sidhu plantation...	1	...	1	...	1	Tali, mulberry and pipal.	450 ditto ditto, of these 50 died.

XXIV.—JHANG.

I.—Avenues.

				Miles.	Miles.	Miles.	Miles.	Miles.				
Jhang	...	...	5	Station roads ...	5	...	5	...	5	Barna, tút, tali, ber, kikar, siris, pipal, banyan and tamarisk.		
				Jhang to boundary of Shahpur district.	1 to 2½ 650 trees, 10 to 11 70 trees, 19 to 20 15 trees, 28 to 29¾ 600 trees	1 to 2½ 130 trees	6	27	33	Ditto	ditto.		
				Jhang to Kharora and Kharora to Maghiana	2	...	2	...	2	Ditto	ditto ...	270 vacancies filled during the year.	
				Sadr to Khaki Shah and Khaki Shah to Kharora.	3	...	3	...	3	Ditto	ditto ...	130	do. do. do.
				Jhang town to Chiniot road.	1	...	1	...	1	Ditto	ditto ...	100	do. do. do.
				Sadr to Atharan-hazari.	1 to 2 400 trees, 16th 150 trees	2 100 trees	3	13	16	Ditto	ditto.		
				Sadr to Lahore *viâ* Pacca Mari	1	...	1	49	50	Ditto	ditto ...	42 vacancies filled during the year.	
				Sadr to Khiwa ...	1 to 2 85 trees 9 to 9½ 50 trees 16th 55 trees		2	15	17	Ditto	ditto.		
				Sadr to Toba Tek Singh	5 to 6 50 trees 12th 65 trees		1	22	23	Ditto	ditto.		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area					Species of trees planted.	Remarks.
				Planted			Un-planted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				Miles.	Miles.	Miles.	Miles.	Miles.		
Chiniot ...		7	Khiwa to the boundary of Gujranwala ...	28 to 29 115 trees 42 to 43 60 trees 51 to 52 138 trees		3	45	48	Barna, tút, tali, ber, kikar, siris, pipal, banyan and tamarisk.	
Shorkot ...		7	Baghri to the boundary of Mooltan	17th 50 trees 23 to 24 65 trees 27 to 28 40 trees 33 to 34 180 trees	2 213 trees	3	36	39	Ditto ditto.	
			Ahmadpur to Madmapal	54th 90 trees 1st 80 trees 12th 110 trees 17th 30 trees		2	18	20	Ditto ditto.	
			Total Avenues ...	28	4	32	225	257		

II.—Groves, Nurseries and Plantations.

				Acres.	Acres.	Acres.	Acres.	Acres.		
Jhang	...	...	4	New nursery garden at Sadr.	5	...	5	...	5	Mango, banyan, pipal, tali, siris, vine, fig-tree, apple, eucalyptus, orange.	6,990 trees planted during the year : total 8,490 trees.
				Grove at Kharora ...	1	...	1	...	1	Tali and siris.	
				New nursery on the bank of Kharora.	...	...	...	...	...	Willow ...	360 willows planted during the year.
				Grove at Toba Tek Singh.	2	...	2	...	2	Tali, tút, ber, siris, kikar and tamarisk.	
				Horse Fair ground ...	4	...	4	...	4	Tali and siris.	
				Rasyana well ...	1	...	1	...	1	Ber, tali, tamarisk, pipal and kikar.	
				Chak Sajhowal ...	342	...	342	...	342	Almost all tali, a small number of kikar, ber, siris and willow.	
				Bela Bagar ...	1	...	1	...	1	Tali.	
Chiniot	...	...	7	Chiniot garden ...	5	...	5	...	5	Orange, tút, mangoes, siris, tali, ber, jaman, banyan, pipal and pomegranate.	
				Tahli Mangini Chak ...	5	...	5	...	5	Kikar, tali, jand, ber and tamarisk.	
				Lodhran-wali chauki ...	2	...	2	...	2	Ditto ditto.	
				Lalian police station ...	1	...	1	...	1	Ditto ditto.	
Shorkot	...	...	8	Tahsil Shorkot garden	2	...	2	...	2	Tali, pomegranate, mangoes, ber, pipal, banyan, tamarisk, jand, orange, tút and jaman.	
				School garden at Shorkot	2	...	2	...	2	Ditto ditto.	
				Jandiwala well ...	...	...	...	...	...	Orange, pomegranate, tali, pipal, tamarisk, ber and kikar.	127 trees.
				Athmuddhi ...	1	...	1	...	1	Kikar, siris and tali.	

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area					Species of trees planted.	Remarks.
				Planted						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
				XXV.—MONTGOMERY. *I.—Avenues.*						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Pakpattan ...	8	7	Montgomery and Pakpattan road.	1	...	1	28	29	Kikar, ber, tali, siris and farash.	In the gardens and on all the roads dead trees have been replaced from nurseries, where the space is again filled up with seedlings. In the gardens bamboo shrubs and fruit trees of many sorts have been planted, as also rose trees in great variety, to say nothing of creepers.
Dipalpur ...	8	5	Okara and Bungla Fazil road.	6	...	6	32	38	Kikar, ber, tali, siris, mulberry, bakain, pipal, farash and lasora.	
Montgomery ...	11	12	Station roads ...	2	1	3	11	14	Siris, ber, bakain, mulberry, bohar, pipal, fig, tali, farash, kikar, tallow tree, grevilha, "lodar" or dún, siris, tun, willow and date.	
			Total Avenues ...	9	1	10	71	81		

II.—Groves, Nurseries and Plantations.

				Acres.	Acres.	Acres.	Acres.	Acres.		
Montgomery	...	11	12	Nursery in city gardens	...	...	...	...	1	Siris, ber, bakain, mulberry, bohar, pipal, fig, tali, farash, kikar, tallow tree, grevilha, "lodar" or dún, siris, tún, willow and date.	
				Museum ...	...	...	...	...	1		
				Dispensary ...	...	...	3	2	5		
				Dâk bungalow compound, Montgomery.	11	...	11	10	21		
				Ditto ditto Chichawatni.	1	1	2	5	7		
Gugera	...	10	6	Station Okara ...	...	1	...	...	1	Kikar, ber and tali ...	
				At 24 different places ...	8	...	8	...	8	Kikar, ber, mulberry, bohar, pipal and farash.	Round wells 50 to 100 trees at each.
Dipalpur	...	8	5	Tahsil garden ...	1	...	1	...	1	Kikar, ber, mulberry, bohar, pipal, apple, date, peach, tali, mango, fig, jaman, siris, bakain, anár and nim.	
				Attari ...	4	...	4	5	9		

XXVI.—MUZAFFARGARH.

1.—Avenues.

					Miles.	Miles.	Miles.	Miles.	Miles.		
Muzaffargarh	...	3	...	Road from Muzaffargarh to Rangpur. ...	6	1	7	42	49	Mulberry 5, tali 420...	70 died.
				Road from Muzaffargarh to Alludiwali *viâ* Khangarh.	11	1	12	13	25	Tali 1,025, jaman 220, mulberry 15.	120 died.
				Road from Tabri garden to junction with Khangarh road.	3	...	3	...	3	120 tali trees planted in blanks.	15 died.
				Road from Ganeshwah bridge to Tabri garden.	1	...	1	...	1	12 tali in blanks ...	All survive.
				Road from police katcherry to Ganeshwah bridge.	...	1	1	...	1	Tali 240 ...	30 died.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area					Species of trees planted.	Remarks.
				Planted						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
				Miles.	Miles.	Miles.	Miles.	Miles.		
			Road from dispensary to junction with Dera Ghazi Khan road.	1	1	2	...	2	Tali 82, mulberry 12...	30 died.
			Station roads ...	1	...	1	1	2	Tali 14, jaman 10 ...	14 died.
Sinanwan ...	...	...	Road from Mahamud Kote to Ahsanpur.	5	1	6	30	36	Siris 44, tali 969 ...	513 died.
Alipur ...	4	...	Road from Rukanwali to Shahr Sultan.	...	...	...	7	7	Tali 500 ...	300 died.
			Road from Shahr Sultan to Alipur.	4	1	5	10	15	Do. 400 ...	All survive.
			Road from Jatoi to Alipur.	1	...	1	9	10	Do. 200 ...	20 died.
			Road from Khairpur to Alipur.	...	1	1	4	5	Siris 78, tali 322 ...	All survive.
			Circular road at Alipur...	...	1	1	...	1	Eucalyptus 9, mango 3, tali 18, siris 80.	Most of these died.
			Ditto at Jatoi ...	...	1	1	...	1	Tali 565 ...	All survive.
			Ditto at Khairpur	...	...	...	1	1	Tali 20, siris 12, pipal 4.	All survive.
			Walliwah Canal ...	...	1	1	...	1	Tali 156 ...	14 died.
			Total Avenues ...	33	10	43	117	160		

II.—Groves, Nurseries and Plantations.

				Acres.	Acres.	Acres.	Acres.	Acres.		
Muzaffargarh	...	3	...	Orchard in Sharif Chhajra	1	...	1	...	1	Some blanks filled ...	In good condition. Full.
				Muzaffargarh encamping-ground—	...	...	...	...	...		
				(1) Plot ...	1	...	1	...	1	Some blanks filled ...	In good condition.
				(2) Plot ...	...	...	...	...	...	Ditto ...	
				(3) Plot ...	...	...	...	...	...	Tali seed sown ...	
				Fringe ...	...	...	...	...	...	Jaman 22, mulberry 2, In blanks.	
				Police hospital inside ...	2	...	2	...	2	Old groves full ...	Thriving.
				Plot outside ...	1	...	1	...	1	Ditto ...	
				Plot outside ...	...	...	...	...	...	Seed of tali sown ...	
				Grove near District Court,	1	...	1	...	1	Old tali roots ...	In good condition.
				Taleri garden ...	25	...	25	...	25	Pomegranate 200, aluchas 44, peaches 50.	All thriving.
				Church compound ...	4	...	4	...	4	Jaman 59, pomegranate 195.	All survive.
				Kuraishi encamping-ground plot.	...	...	...	...	...	Some blanks filled ...	In good condition.
				Fringe ...	...	...	...	...	...	Old grove full ...	In good condition.
				Langar Sarai rest-house, Grove ...	...	...	...	...	...	Ditto ...	Ditto.
				Plot ...	1	1	...	1	...	Tali seed sown ...	Ditto.
				Dispensary Compound ...	2	...	2	...	2	Old grove full ...	Ditto.
				Plot of ground ...	...	...	...	...	...	Tali seed sown ...	Ditto.
				Grove on Kureshi road 23 miles.	...	1	1	...	1	Tali 44, jaman 84, mulberry 72.	All survive.
				Khangarh encamping-ground.	2	...	2	...	2	Old grove ...	In good condition.
				Trees near police rest-house.	...	...	...	...	...	Ditto ...	Ditto.
				Cemetery grove ...	1	...	1	...	1	29 tali in blanks ...	All survive.
				Plot ...	...	...	...	...	...	Tali seed sown ...	Thriving.
				Mithuwala well fringe,...	...	...	...	...	...	58 tún, 82 tali of former years.	Good.
				Plot ...	...	...	...	...	...	Tali, seed sown ...	Thriving.
				Treasury building grove,	1	1	2	...	2	Ditto. ...	Ditto.

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area					Species of trees planted.	Remarks.
				Planted			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				Acres.	Acres.	Acres.	Acres.	Acres.		
Muzaffargarh ...			Grove in mile No. 3½ ...	...	...	...	...	...	58 tali planted in gaps.	Thriving.
			Muzaffargarh and Khangarh road.							
			Plot in mile 3 ...	...	1	1	...	1	Tali, seed sown ...	Soil dry and crop not good.
Sinanwan ...			Sinanwan garden ...	4	1	5	...	5	Eucalyptus 10, jaman 40, mango 29, plantains 20, fig 6, apple 2, orange 15, peach 8, alucha 8, pomegranate 16, bamboo 20.	50 of these died.
			Kotadu encamping-ground.	...	...	...	...	...	Tali 108, bonar 2, kikar 5.	55 died.
			Dera Dinpanah ...	...	...	...	...	...	Tali 19 ...	5 died.
			Mirwali ...	...	...	...	...	...	Farash 60 ...	40 died.
			Soban Machhi ...	...	1	1	...	1	Seed of siris and tún sown.	In good condition.
			Muna and Ahsanpur schools.	...	...	...	...	...	...	Old trees maintained.
Alipur ...	4	...	Lowland at Alipur ...	...	1	1	...	1	Tali 20 ...	18 died.

			Basti Arif ...	...	14	14	...	14	Tali seed sown ...	Thriving.
			Khanpur encamping-ground.	3	...	3	...	3	73 tali in blanks ...	Thriving.
			Shahr Sultan ditto ...	2	...	2	...	2	Some blanks filled ...	In good condition.
			Jatoi ditto ...	1	...	1	1	2	Ditto ditto.	
			Alipur ditto ...	2	...	2	...	2	6 Eucalyptus ...	All in good condition.
			Compound of stallion stables fringe.	...	...	...	...	...	23 jaman ...	All thriving.
			In 128 plots, pieces of roots of tali tree have been planted.							

XXVII.—DERA ISMAIL KHAN.

Report not received on 1st October 1881.

XXVIII.—DERA GHAZI KHAN.

I.—Avenues.

				Miles.	Miles.	Miles.	Miles.	Miles.		
Dera	...	7	6	Dera Ismail Khan road,	3	1	4	125	129	Tali.	
				Sheru road ...	5	1	6	15	21	Do.	
				Road from Dera to Jampur.*	17	...	17	55	72	Tali and kikar ...	Gaps filled up during the year. This is part of the Rajanpur road.
				From Cantonment to Kot Chutta road.	2	...	2	...	2	Tali.	
				From Katchery to Dera Ismail Khan road.	2	1	3	...	3	Do.	
				Fatteh Shah road ...	1	...	1	...	1	Do.	Gaps filled up during the year.
				Kuraishi road ...	3	...	3	...	3	Do.	
				City circular road ...	2	...	2	...	2	Tali and siris.	Ditto ditto.
				Vidor road ...	2	...	2	10	12	Tali.	
Rajanpur	...	2	2	Mithankot road ...	1	1	2	10	12	Do.	
				Hanum W. road,	2	2	4	16	20	Do.	
				Rajanpur city circular road.	...	1	1	1	2	Do.	
				Rajanpur cantonment road	2	...	2	...	2	Do.	
	...	2	3	Hajipur road ...	3	...	3	15	18	Do.	
Jampur				Dajal road ...	1	...	1	16	17	Do.	
				TOTAL AVENUES ...	46	7	53	263	316		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				II.—Groves, Nurseries and Plantations.						
				Acres.	Acres.	Acres.	Acres.	Acres.		
			3 Nurseries on Kot Chutta road.	1	1	2	...	2	Tali	These nurseries supply plants for road sides. As plants are taken from them, seed is sown to get up a fresh supply of plants.
			1 Ditto on Sheru road.	1	...	1	...	1	Do.	
			1 Ditto on Sakhi Sarwar road.	1	...	1	...	1	Do.	
			1 Ditto on Dera Ismail Khan road.	1	...	1	...	1	Do.	
			Plantations on Kot Haibat rakhs.	5	5	10	...	10	Eucalyptus and tali.	
				XXIX.—BANNU.						
				I.—*Avenues.*						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Bannu ...	14	11	From Edwardesabad to Bazar Ahmad Khan.	2	...	2	...	2	Chiefly tali and mulberries with a few willows, ber, drek, &c. (altogether 1,202 trees).	
			From Regimental Bazar to Bazar Ahmad Khan road.	1	...	1	...	1	Principally talí and mulberries with a few ber and willows (total 340 trees).	

			From Edwardesabad to Hawed.	6	...	6	5	11	Mulberries, tali, ber, with a few willows and karim (altogether 254 trees).	The road is planted as far as irrigation extends.	No new lengths of road were planted, but about 1,250 trees altogether were planted on these roads to fill up gaps.
			From Edwardesabad to Mirian.	6	...	6	2	8	Mulberries, tali and ber, with a few willows and khaggal, (altogether 4,653 trees).		
			From Kurram Fort road to Fort at Tochi.	...	...	...	5	5	Tali and mulberries, with a few willows and ber, (altogether 120 trees).		
			From Kurram Fort road to Cavalry Butts.	1	...	1	...	1	Mulberries and tali, with a few willows, ber, bakain, (altogether 311 trees).		
			Circular road ...	1	...	1	1	2	Tali and mulberries, &c., &c.	Further planting on this road is not desirable, as the country adjoining the road on both sides is well wooded, and, as the road is only used for evening drives, trees would only stop ventilation.	
Laki Marwat ..	15	9	From Nourung to Lakki.	6	...	6	9	15	Principally tali and mulberries, with a good many kikar, also bakain and khaggal.	On both roads together there are 5,714 trees. No new trees have been planted except to fill up blanks. Of the latter trees the Tahsildar reports that 600 have been planted during the year, of which about two-thirds survive.	
			From Nourung and Laki road to Bergi (Landiwah road).	2	...	2	12	14	Ditto.		
Isa Khel ...	13	8	From Isa Khel to Kalabagh.	6	...	6	24	30	Kikar, tali, ber and khaggal (altogether 1,500 trees).		
			From Isa Khel to Bhor.	1	...	1	...	1	Chiefly kikar, also a few ber (altogether 391 trees).		

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued.)

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.						
	Average.	During the year.		In previous year.	During the year.	Total.	Unplanted.	Total length of road or area in miles.		
				Acres.	Acres.	Acres.	Acres.	Acres.		
			From Isa Khel to Darrah Tang.	2	...	2	5	7	Kikar, tali, ber, and a few mulberries (altogether 1,188 trees).	
			From Isa Khel to Khaggalanwala.	1	...	1	2	3	Kikar and a few ber (altogether 109 trees).	
Mianwali ...	13	8	From Court-house to tahsil building.	1	...	1	2	3	Ber, kikar and tali.	On these 3 roads (which are really portions of one and the same road) there are altogether 305 old trees, and 106 new ones have been planted during the year, but the planting has failed to keep pace with the loss; 114 of the trees previously planted having died during the year from drought.
			From Court-house to police station.	...	1	1	2	3	Do. with a few sarin, khaggal and mulberries	
			From Court-house to Musa Khel.	...	...	...	2	2	Do. with a few ber.	
			Total Avenues ...	36	1	37	71	108		

II.—Groves, Nurseries and Plantations.

				Acres.	Acres.	Acres.	Acres.	Acres.		
Bannu	...	...	...	...	...	...	*Nil.*			
Laki	...	...	...	...	...	...	*Nil.*			
Isa Khel	...	...	...	At Kamarmushani ...	3	...	3	...	3	Nearly all tali, with a few kikar and ber.	
Mianwali	...	...	...	...	...	...	*Nil.*				
Bannu	...	...	...	At Nourung ...	...	...	...	...	...	...	This is a nursery of young trees, principally tali and mulberries. It is all planted, but the Tahsildar has omitted to give the exact area, which will be entered in next year's report.
Laki	...	...	...	}							
Isa Khel	...	...	...	}			*Nil.*				
Mianwali	...	..	...	}							
Bannu	...	...	...	...			*Nil.*				
Laki	...	...	...	Dâk bungalow at Laki.	1	...	1	...	1		
				Tahsil Laki ...	...	...	...	...	...	Principally tali and kíkar, with some khaggal and ber.	
				Dispensary building ...	1	...	1	...	1		
				Serai Laki ...	...	...	...	...	...		
Isa Khel	...	...	...	Dispensary Isa Khel ...	1	...	1	...	1	Kikar and tali.	
				Ditto Kalabagh ...	...	...	...	1	1	Principally ber.	
				Tahsil and police station at Isa Khel.	...	...	...	1	1	A few kikar.	
				Dâk bungalow Isa Khel.	...	...	...	1	1	A few pipal and kikar.	
				Serai Isa Khel ...	...	...	...	1	1	Ber, kikar and tali.	
				Serai Kalabagh ...	...	...	...	1	1	A few kikar and tali.	
				Police post at Teamar Mushani.	...	...	...	1	1	A few ber and kikar.	
				Encamping-ground at Kamar Mushani.	...	...	...	2	2	A few ber and pipal...	
Mianwali	...	...	...	Station garden ...	4	...	4	2	6	Ber, kikar, tali, sarin, mulberries, khaggal, pipal and dates, &c., &c.	Altogether these plantations aggregate about 400 trees.
				Well at Wanbhachran	...	...	...	1	1	Ber, khaggal and kikar	
				Dâk bungalow at Namal	...	...	...	1	1	Tali, bakain and mulberries.	

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Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued).

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				XXX.—PESHAWAR. *I.—Avenues.*						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Peshawar ...	15	7	Urmar road ...	5	...	5	11	16	Tali, mulberry, ghaz and willow.	Many blanks left.
			Phandu road ...	1	1	2	...	2	Ditto.	Ditto.
			Guri Sirdar road ...	3	...	3	...	3	Ditto. ...	Ditto.
			Cattle-market road ...	...	2	2	...	2	Ditto. ...	Ditto.
			Hashtnagar road ...	4	...	4	...	4	Ditto. ...	Ditto.
			Edgha road ...	1	...	1	...	1	Ditto. ...	Ditto.
			Charperizia road ...	2	...	2	...	2	Ditto. ...	Ditto.
			Jubbah road ...	1	...	1	...	1	Ditto. ...	Ditto.
			Bara road ...	4	1	5	1	6	Ditto. ...	Ditto.
			Bhandwari road ...	1	...	1	...	1	Ditto. ...	Ditto.
			Circular road ...	7	...	7	...	7	Ditto. ...	Ditto.
Mardan ...	...	...	Mangan road ...	2	...	2	6	8	Tali and ghaz ...	Ditto.
			Dosura road ...	3	...	3	5	8	Ditto. ...	Ditto.
			Dispensary road ...	1	...	1	...	1	Ditto. ...	Ditto.
			Raslakai ...	2	...	2	3	5	Tali, ghaz and mulberry	Ditto.
			Hoti ...	...	2	2	...	2	Ditto. ...	Ditto.

Swalie ...	15	7	Jehangir to Lahore ...	8	1	9	1	10	Tali, ghaz and mulberry	Many blanks left.
			Do. to Zeda ...	2	3	5	...	5	Ditto. ...	Ditto.
			Ismaila to Topí ...	2	2	4	22	26	Ditto. ...	Ditto.
			Manki to Ambar ...	...	3	3	...	3	Ditto. ...	Ditto.
			Maneri road ...	...	1	1	...	1	Ditto. ...	Ditto.
Hashtnagar ...	...	...	Kheshki to Abazai ...	3	5	8	12	20	Tali, willow and ghaz	Ditto.
			Charsadda to Nissutta...	1	2	3	...	3	Ditto. ...	Ditto.
Daudzai ...	...	...	Mardan ...	7	2	9	...	9	Mulberry, tali, willow and ghaz.	Ditto.
			Hashtnagar ...	4	2	6	...	6	Ditto. ...	Ditto.
			Charperizia ...	8	...	8	2	10	Ditto. ...	Ditto.
			Muthra ...	3	1	4	2	6	Ditto. ...	Ditto.
			Darbungi ...	3	2	5	...	5	Ditto. ...	Ditto.
			Michni ...	3	...	3	...	3	Ditto. ...	Ditto.
			Sarikh ...	5	2	7	...	7	Ditto. ...	Ditto.
			Kangra ...	3	1	4	...	4	Ditto. ...	Ditto.
			Abazai ...	8	2	10	...	10	Ditto. ...	Ditto.
			TOTAL AVENUES ...	97	35	132	65	197		
			II.—Groves, Nurseries and Plantations.							
				Acres.	Acres.	Acres.	Acres.	Acres.		
Mardan ...	...	...	Fatma road ...	...	1	1	...	1	Tali, ghaz and mulberry.	
			Nissutta road ...	...	1	1	...	1	Ditto.	
			Dheri Mirwez ...	...	1	1	...	1	Ditto.	
			Jelala road ...	...	2	2	...	2	Ditto.	
			Bank of the Kalpani stream ...	...	1	1	...	1	Ditto.	

Statement showing the Avenues and Groves planted in the several Districts of the Punjab during the year 1880-81.—(Continued).

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road or area in miles.		
	Average.	During the year		In previous year.	During the year.	Total.				
				XXXI.—HAZARA.						
				I.—Avenues.						
				Miles.	Miles.	Miles.	Miles.	Miles.		
Abbottabad ...			Dhobighat ...	2	...	2	1	3	Pine, mulberry, bakain, walnut, willow and bankhor.	Replanting on old work: 1,200 trees planted.
			Mirpur to Nawashahr ...	1	...	1	3	4	Mulberry and bakain	Ditto ditto: 300 trees planted.
			Murree—Nawashahr branch.	1	..	1	...	1	Mulberry, bakain, hari, bankhor and willow.	Ditto ditto: 636 ditto.
	...	...	Abbottabad station ...	2	1	3	...	3	Pine, walnut, bankhor, bakain hari and chinar.	New work: 600 ditto.
			Local roads ...	1	...	1	...	1	Mulberry, hari and eucalyptus.	Replanting on old work: 110 trees planted.
Mánsehra ...			Shinkiari to Mansehra	9	...	9	3	12	Tali, mulberry, bakain and pine.	Made over to Executive Engineer: 600 trees planted.
			Bajua to Baffa ...	...	4	4	...	4	Ditto ...	Newwork: 560 trees planted.
			Baffa to Khaki ...	...	3	3	7	10	Ditto ...	Ditto: 500 ditto.
			Haripur to Khanpur ...	4	1	5	7	12	Ditto ...	Ditto: 3 miles cannot be planted owing to rocky nature of roadside: 748 trees planted.
			Local roads ...	3	...	3	...	3	Mulberry, eucalyptus, grapes and siris.	Replanting: 335 trees planted.
			Total Avenues ...	23	9	32	21	53		

II.—Groves, Nurseries and Plantations.

				Acres.	Acres.	Acres.	Acres.	Acres.		
Abbottabad	...			Round tahsil	...	3	3	...	3	Seeds of pine, biar and deodara.	New work, seeds 3 maunds, : 317, trees planted.
				Round Sheikhan Bandi tank.	...	...	...	...	...	Willows. ...	New work : 300 trees planted.
				Encamping-ground Khokar.	...	...	...	...	...	Tali and siris. ...	Ditto : 41 ditto.
				Ditto Mangal ...	...	...	...	...	...	Pine ...	Ditto : 209 ditto.
				Sultanpur nursery ...	1	...	1	...	1	Seeds of pine, tali, tun and ber, trees eucalyptus, siris and bakain.	Replanting seeds 2½ maunds : 17 trees planted.
				Abbottabad civil rakh	12	1	13	296	309	Pine seeds. ...	Replanting seeds 1 md. 15 seers.
Mansehra	...			Shinkiari nursery ...	...	...	...	...	...	Seeds of pine, hari, alucha and peach.	Ditto 20 seers.
				Mansehra nursery ...	1	...	1	...	1	Ditto cyprus, eucalyptus, bakain and hari	Ditto 15 seers.
Haripur	...			Haripur encamping-ground.	...	...	...	...	...	Mulberry and tali ...	Ditto : 26 trees planted.
				Haripur nursery ...	1	...	1	...	1	Seeds of mulberry, tali, siris and mangoes.	Ditto seeds 1 maund.
Abbottabad	...			Abbottabad garden ...	25	...	25	...	25	Pine seeds; trees grafted, peach, pear and apple.	Ditto 20 seers ; grafted 80 trees.
				Haripur municipal and nazul gardens.	45	...	45	...	45	Eriobobya joponica (loquat), pear, hari, glass (cherry), mangoes, alucha, anar, cyprus and eucalyptus.	Ditto ; grafted 1,279 trees.

XXXII.—KOHAT.

I.—Avenues.

				Miles.	Miles.	Miles.	Miles.	Miles.		
Kohat	...	17	15	Kohat and Bannu road	4	...	4	60	64	Tali and mulberry.	
				Kohat and Thal road ...	...	5	5	55	60	Ditto.	
				TOTAL AVENUES ...	4	5	9	115	124		

Part II.

Canal Arboriculture Statements.

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				I.—BARI DOAB 1st DIVISION.						
				First Sub-Division.						
Pathankote ...			*Avenue single line.*	Miles.		Miles.		Miles.		
Madhopur ...	51	44	Main Line of Canal ...	41	...	41	...	41		
			Salampur Raj ...	15	...	15	...	15		
			Nuloa cut ...	12	...	12	...	12	...	Most of the 12 miles once planted on Nuloa have died, or been eaten by cattle.
				68	...	68	...	68		
			Plantations.	Acres.		Acres.		Acres.		
			Main Line of Canal ...	467	...	467	...	467	...	47 acres on right bank and 44 on left bank of Canal between Madhopur and No. 1 Rapid have died, the soil being unsuitable. These are included in the 483 acres here shown as having been planted.
			Dinanagar Navigation Channel ...	16	...	16	...	16		
				483	...	483	...	483		
			Avenue single line.	Miles.		Miles.		Miles.		
Tibri ...	30	40	Main Line of Canal ...	24	...	24	...	24		
			Main Branch, Upper Bari Doab Canal ...	37	...	37	...	37		
				61	...	61	...	61		

				Plantations.	Acres.		Acres.		Acres.			
Gurdaspur ...	...	...	Main Line of Canal ...	198	...	198	...	198			
			Main Branch, Upper Bari Doab Canal ...	325	...	325	...	325			
			Dinanagar Navigation Channel	39	...	39	...	39			
			Sirkian Escape ...	175	...	175	...	175			
				737	...	737	...	737	Tali, mulberry, mango, siris, kikar, phulai tun, &c., &c.	In the 737 acres here shown, there are altogether about 14 acres of gaps, where the soil being unsuitable the trees have not grown.
			Avenues of single line.	Miles.		Miles.		Miles.		
Kullair ...	33	23	Main Branch, Upper Bari Doab Canal ...	12	...	12	...	12		
			Plantations.	Acres.		Acres.		Acres.		
Batala ...	...	...	Main Branch, Upper Bari Doab Canal ...	115	...	115	...	115		
				141	...	141	...	141		
			TOTAL ... { Avenues, miles ...	1,335	...	1,335	...	1,335		
			{ Plantation, acres ...				...			
			SECOND SUB-DIVISION.							
			Miles of Canal planted.							
Gurdaspur ...	...	...	Bari Doab Canal, Kasur Branch, Upper ...	6	...	6	1	7	Siris, tali and phulai ...	These lines originally planted on each bank are now well grown.
Ditto. ...	...	...	Ditto, Kasur Branch, Lower ...	6	25	31	36	67	Chiefly tali, few mangoes.	The first 6 miles are now well-wooded. About 24 miles in all have also been previously operated upon, but the results were very poor, and systematic planting was first taken in hand during the year, proper arrangements, for watering the trees being made: 12,800 trees were put in, forming 3 rows on each bank for 18 miles, and remainder 7 miles single row on each side.
					Acres.	Acres.	Acres.	Acres.		
			Ditto ditto	...	45	45	751	796	Tali, siris and kikar ...	In trenches.
				Miles.	Miles.	Miles.	Miles.	Miles.		
Gurdaspur, Batala and Amritsar ...	...	...	Sobraon Branch ...	7	24	31	31	62	Tali and few mangoes ...	Same remarks as for Lower Kasur Branch: 9,800 trees put in, 3 rows for 17 miles, and 7 miles single row.
				Acres.	Acres.	Acres.	Acres.	Acres.		
			Ditto ...	55	25	80	675	755	Tali, siris and kikar ...	In trenches.
			TOTAL SECOND SUB-DIVISION ... { Avenues, miles ...	19	49	68	68	136		
			{ Plantations, acres	55	70	125	1,436	1,551		
			GRAND TOTAL 1ST DIVISION, BARI DOAB CANAL ... { Avenues, miles ...	166	49	209	68	277		
			{ Plantations, acres,	1,390	70	1,460	...	1,460		

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road.		
	Average.	During the year.		In previous year.	During the year.	Total.				
				II.—2nd DIVISION, BARI DOAB CANAL.						
				Miles.	Miles.	Miles.	Miles.	Miles.		
MAIN BRANCH LOWER.										
Gurdaspur District.										
Tahsil Batala ...	30	25	Bari Doab Canal Main Branch Lower ...	3	...	3	...	3	Tali, mulberry, tun ...	The line of trees is on both sides: 185 trees were planted during the year.
Amritsar District.										
Tahsil Amritsar ...	27	26	Ditto ditto ...	25	...	25	...	25	Ditto ditto ...	413 trees were planted during the year
Do. Tarn Taran ...	21	19	Ditto ditto ...	14	...	14	...	14	Kikar, farash, mango, &c.	250 ditto ditto ditto.
Lahore District.										
Tahsil Kasur ...	17	16	Ditto ditto ...	32	...	32	...	32	Ditto ditto ...	200 ditto ditto ditto.
Do. Chunian ...	16	15	Ditto ditto ...	19	...	19	...	19	Ditto ditto	100 ditto ditto ditto.
Total Main Branch Lower.	...	...	...	93	...	93	...	93		
LAHORE BRANCH.										
Gurdaspur District.	30	25								
Tahsil Batala ...			Bari Doab Canal Lahore Branch	5	...	5	...	5	Ditto ditto ...	6 trees were planted during the year.
Amritsar District.	27	26								
Tahsil Amritsar ...	21	20								
Do. Ajnala ...	21	19	Ditto ditto ...	8	...	8	...	8	Ditto ditto ...	502 ditto ditto ditto.
Do. Tarn Taran ...			Ditto ditto ...	21	...	21	...	21	Ditto ditto ...	744 ditto ditto ditto.
Lahore District.	25	21	Ditto ditto ...	6	...	6	...	6	Ditto ditto ...	300 ditto ditto ditto.
Tahsil Lahore ...	...	...	Ditto ditto ...	22	...	22	...	22	Ditto and Eucalyptus	1,100 ditto ditto ditto.
Total Lahore Branch ...	...	...	Avenues—Miles ...	62	...	62	...	62	...	2,652 ditto ditto ditto.
Total both Branches...			Avenues—Miles ...	155	...	155	...	155	...	It is believed that the whole length of the Canal has been at some time or another operated on. The trees have been planted in gaps extending over a long line.

Chunian	...	*16	12								
Dipalpur	...	8	5								
Pakpattan	...	9	7								
Chunian	...	16	12								
Dipalpur	...	8	5								
Pakpattan	...	9	7								
Chunian	...	16	12								
Kasur	...	26	14								
Dipalpur	...	8	5								
				III.—UPPER SUTLEJ INUNDATION CANALS.							
				Khanwah Canal and its rajbuhas	...	Miles. 116	Miles. ...	Miles. 116	Miles. ...	Miles. 116	Mostly kikar, but there are a few tali and plum trees.
				Upper Sohag Canal and its rajbuhas	...	69	...	69	...	69	
				Katora Canal and its rajbuhas		116	...	116	...	116	
				TOTAL AVENUES ...		301	...	301	...	301	
				IV.—LOWER SUTLEJ AND CHENAB INUNDATION CANALS.							
Serai Sidhu	...	...	...	Matithal	...	17	...	17	...	17	
Mooltan	...	...	...	Khadal	...	11	...	11	...	11	Tali, kikar, farash, ber, mulberry and siris.
Ditto	...	...	...	Taharpur	...	7	...	7	...	7	
Ditto	...	...	...	Shahpur	...	15	...	15	...	15	
Ditto	...	...	...	Daurana Langana	...	30	...	30	...	30	As above
Ditto	...	...	...	Wali Muhammad	...	33	...	33	...	33	Ditto, date and mangoes.
Shujabad	...	...	...	Sikandrabad	...	30	...	30	...	30	As above
Ditto	...	...	...	Gajjuhatta	...	19	...	19	...	19	Ditto
Ditto	...	...	...	Bakhtuwah	...	19	...	19	...	19	Ditto
Ditto	...	...	...	Dhundu	...	15	...	15	...	15	Ditto
Ditto	...	...	...	Pinjani	...	2	...	2	...	2	Ditto
Ditto	...	...	...	Sikandarwah	...	8	...	8	...	8	Ditto
Mailsi	...	...	...	Bilochanwala	...	9	...	9	...	9	Ditto
Ditto	...	...	...	Diwanwah	...	30	...	30	...	30	Kikar
Ditto	...	...	...	Jainwah Khurd	...	24	...	24	...	24	Farash
Ditto	...	...	...	Chattarwah	...	12	...	12	...	12	Tali
Ditto	...	...	...	Jauwah Kalan	...	36	...	36	...	36	Ber
Ditto	...	...	...	Kabilwah	...	15	...	15	...	15	Date
Ditto	...	...	...	Sadikwah	...	2	...	2	...	2	Pilu
Lodhran	...	...	...	Bhawalwah	...	30	...	30	...	30	Jand
Ditto	...	...	...	Sultanwah	...	30	...	30	...	30	Pipal
Ditto	...	...	...	Abanwah	...	7	...	7	...	7	s above
Ditto	...	...	...	Jamraniwah	...	11	...	11	...	11	Ditto
Ditto	...	...	...	Mahomedwah	...	40	...	40	...	40	Ditto
Ditto	...	...	...	Sirdarwah	...	35	...	35	...	35	Ditto
Ditto	...	...	...	Bhawalwah	...	16	...	16	...	16	Ditto
Ditto	...	...	...	Shekhwah Sharkia	...	15	...	15	...	15	Ditto
Ditto	...	...	...	Mubarikwah	...	16	...	16	...	16	Ditto
Ditto	...	...	...	Khanwah	...	16	...	16	...	16	Ditto
Ditto	...	...	...	Shekhwah Gharbia	...	5	...	5	...	5	Ditto
Ditto	...	...	...	Hafizwah	...	10	...	10	...	10	Ditto
				TOTAL CANALS	...	565	...	565	...	565	
Serai Sidhu	...	...	...	Chenab Bund	...	15	...	15	...	15	Same as above.
				TOTAL AVENUES—MILES	...	580	...	580	...	580	

The trees in this division are of spontaneous growth, except in the compounds of canal chaukies at Gudar Malkana, Ladhiwal and Bunga Hyat, on the Upper Sohag Canal and Lodian on the Katora canal.

* The averages of rain-fall are taken as below :—

Kasur	20 years.	Dipalpur	13 years.
Chunian	10 „	Pakpattan	„

The trees growing on the canal spoil-banks are mostly self-sown. The numbers per mile of length vary considerably in different portions of the canal. In some places there are very few, in others they are very close together, forming an avenue with the branches overhanging the water. Towards the tails of the canals the trees are smaller than higher up and more of a jungly character. At the heads of nearly all these canals, and for 5 or 6 miles down, the trees are few in number. Nearly all the trees are growing on the water's edge, and there are very few growing upon the spoil-banks themselves that is away from the water's edge. It is useless attempting to plant them upon the silt. Towards the tails of the canals where the annual deposits excavated from the beds are less sandy and more clayey than in the upper portions, the spoil-banks are often covered with ber, jál and farash trees, which are sold as fuel. No trees have been planted on the canals during the year.

About 377 young tali plants put in during the year in place of others that had died.

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
				Planted.			Unplanted.	Total length of road.		
	Average.	During the year.		In previous year.	During the year.	Total.				
			IV—LOWER SUTLEJ AND CHENAB INUNDATION CANALS.—(Contd.)							
			Chanki Compounds.	Acres.	Acres.	Acres.	Acres.	Acres.		
Serai Sidhu ...	...	...	Binda ...	6	...	6	...	6	Same as above	
Mooltan ...	...	...	Khanpur ...	6	...	6	...	6	Ditto	
Ditto ...	...	...	Kasba ...	6	...	6	...	6	Ditto	
Shujabad ...	...	...	Buch ...	6	...	6	...	6	Ditto	
Ditto ...	...	...	Shujabad ...	10	...	10	...	10	Ditto	Bad soil.
Ditto ...	...	...	Satburji ...	50	...	50	...	50	Ditto	Bad saltpetre soil, covered with farash.
Mailsi ...	...	...	Islamke ...	3	...	3	...	3	Ditto	
Ditto ...	...	...	Khanpur ...	1	...	1	2	3	Ditto	
Ditto ...	...	...	Lalsaggu ...	1	...	1	2	3	Ditto	No planting operations could be undertaken in any of these compounds for want of funds. In most of the compounds many more trees might be planted if funds were available.
Ditto ...	...	...	Futtehpur ...	1	...	1	2	3	Ditto	
Ditto ...	...	...	Tibbi Wadan ...	1	...	1	2	3	Ditto	
Lodhran ...	...	...	Kahror ...	2	...	2	2	4	Ditto	
Ditto ...	...	...	Basaulpur ...	1	...	1	2	3	Ditto	
Ditto ...	...	...	Haveli ...	1	...	1	2	3	Ditto	
Ditto ...	...	...	Lodhran ...	1	...	1	2	3	Ditto	
Ditto ...	...	...	Jugguwah ...	1	...	1	2	3	Ditto	
Ditto ...	...	...	Koreishiwalla ...	1	...	1	2	3	Ditto	
			Total Plantations—acres ...	98	...	98	20	118		
			V.—INDUS CANALS, DERA GHAZI KHAN.							
				Miles.		Miles.		Miles.		
Dera Ghasi Khan ...	...	6	Kala bund ...	1	...	1	...	1	Tali	
			Loop Line bund ...	1	...	1	...	1	Do	
			Fazalwah do ...	1	...	1	...	1	Do	
			Shah Sadir Deen bund ...	3	...	3	...	3	Do	
			Kote Dand do ...	4	...	4	...	4	Do	
			Mirhatti do ...	1	...	1	...	1	Do	
			Bahar Shah do ...	4	...	4	...	4	Do and kikar.	

				Manka Canal ...	8	...	8	...	8	Tali.		
				Baja branch ..	8	...	8	...	8	Do. and tun		
				Shoria Canal ...	14	...	14	...	14	Do. and siris		
				Karia Alladad ...	1	...	1	...	1	Tali		
				Kasturi Canal ...	9	...	9	...	9	Do.		
				Klean Dewan branch ...	4	...	4	...	4	Do.		
				Dhingana Canal ...	3	...	3	...	3	Do.		
				Chibri Canal ...	2	...	2	...	2	Do.		
				Sahaban do. ...	4	...	4	...	4	Do.		
Jampur	...	...	3	Gamunwala Canal ...	1	...	1	16	17			
				Sohan do. ..	2	2	4	7	11			
				Hashim branch ...	...	...	...	10	10			
				Pharia do. ...	...	1	1	7	8			
				Mir Canal ...	3	4	7	19	26			
				Islam branch of Mir Canal ...	...	2	2	13	15			
				Muhammad Branch do. ...	...	...	...	6	6			
				Dhundi supply channel ...	2	...	2	3	5			
				Dhundi Canal ...	8	...	8	43	51	83 per cent. of the trees		
				Kutali Canal ..	6	...	6	30	36	are tali, 9 per cent.		
				Kalu, Lunda, Fazil, Chatul, Raj, hazuri and Mubarick branches of Kutab Canal.	...	2	2	36	38	kikar or babul, and 6 per cent. siris.		
Rajanpur	...	...	2	Kadra Canal ...	...	...	...	40	40			
				Hamid, Pahar, Ghutli, Gaimal and Bhagsari branch of Kadra Canal,	...	...	...	27	27			
				Bunds near Shajan Jamal ...	6	1	7	...	7			
				Buliwala Bund ...	2	...	2	...	2			
				TOTAL AVENUES—MILES ...	98	12	110	257	367			
					Acres.	Acres.	Acres.	Acres	Acres,			
Rajanpur	...	...	2	Shah Jamal chauki compound ...	6	...	6	...	6			
				Kotla Sial do. do. ...	2	...	2	..	2			
				Buliwalah do. do. ...	3	...	3	...	3			
				Fazilpur do. do. ...	5	1	6	...	6			
				Rajanpur do. do. ...	8	...	8	...	8			
Dera Ghazi Khan	...	...	...	Sharaf Shah nursery ...	11	...	11	...	11	Tali ...		In the chaukies part of the compound is laid out in plantations and part in avenues. Acres refer to areas of plantations.
				Bahar Shah chauki ...	1	...	1	...	1	Do. and mangoes		
				Jhoke chauki ...	2	...	2	...	2	Do. do.		
				Paiga „ ...	1	...	1	...	1	Do. do.		
				TOTAL PLANTATIONS—ACRES ...	39	1	40	...	40			

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
	Average.	During the year.		Planted.			Unplanted.	Total length of road.		
				In previous year.	During the year.	Total.				
VI.—SIRHIND CANAL, MAIN LINE DIVISION.										
				Acres.	Acres.	Acres.	Acres.	Miles.		
Sirhind Canal Main Line ...	3	40	Main Canal and out-fall channels	881	75	956	*290	78	Mulberry, jamun, tun, mango, teik gum, kikar and tali planted.	The areas are only a rough approximation, and will subsequently be measured and tabulated by miles. *This does not include spoil-banks on cross-drainage channels.
VII.—SIRHIND CANAL, 3RD DIVISION.										
				Miles.	Miles.	Miles.	Miles.	Miles.		
Ludhiana and Jagraon } Ludhiana ...	27	35								
Ludhiana and Jagraon } district ...	21	...	Sirhind Canal, 3rd Division ...	128	6	134	70	204	Sissu and kikar.	
			Total Avenues—Miles ...	128	6	134	70	204		
				Acres.	Acres.	Acres.	Acres.	Acres.		
Mogah, Ferozepore district,	20	...	Sirhind Canal, 3rd Division ...	844	337	1,181	...	1,181	Sissu and kikar ...	Sowing of old spoil-banks was stopped by order of Chief Engineer.
			Total Plantations—Acres ...	844	337	1,181	...	1,181		
VIII.—SIRHIND CANAL, 4TH DIVISION.										
				Miles.	Miles.	Miles.	Miles.	Miles.		
Ferozepore ...	23	12	S. N. channel ...	4	...	4	19	23	Kikar and tali ...	Trees 4 to 12 feet high. In some places injured by cattle.
Mogah ...	20	7	Ditto ...	4	...	4	18	22		
			Total Avenues—Miles ...	8	...	8	37	45		
				Acres.	Acres.	Acres.	Acres.	Acres.		
Ferozepore ...	...	...	S. N. Channel ...	40	...	40	180	220	Kikar and tali ...	Kikar and tali fair. Spoil-banks of Kikar small. Canal.
Mogah ...	...	...	Ditto. ...	15	...	15	185	200	Kikar ...	
Ferozepore ...	...	...	Ditto. ...	6	...	6	5	11	Tali and siris ...	Chauki compounds.
Mogah ..	...	...	Ditto. ...	4	...	4	4	8		
Ditto ...	...	...	Abohar branch ...	40	...	40	220	260	Kikar and tali ...	40 acres planted, but failed for want of rain.
			Total Plantations—Acres ...	105	...	105	594	699		

IX.—SIRHIND CANAL, 5TH DIVISION.

FIRST SUB-DIVISION—PLANTATION.

Sahibgarh, Patiala	...	At Berthla 28 for 5 years.	At Berthla 40 ...	1st Feeder	...	Acres. 19	...	Acres. 19	Acres. 300	Acres. 319	Kikar and very few tali	No avenues.
Samralla, British	...	Ditto ...	Ditto ...	Ditto	...	1	...	1	10	11		
Sahibgarh, Patiala	...	Ditto ...	Ditto ...	2nd Feeder	...	3	...	3	15	18		
Samralla, British	...	Ditto ...	Ditto ...	Ditto	...	1	...	1	12	13		
Amargarh, Patiala	...	Ditto ...	Ditto ...	Ditto	...	1	...	1	16	17		No planting operations during the year.
Nabha, Nabha	...	Ditto ...	Ditto ...	Ditto	...	6	...	6	238	244		
Samralla, British	...	Ditto ...	Ditto ...	Kotla Branch	...	10	...	10	54	64		
Amargarh, Patiala	...	Ditto ...	Ditto ...	Ditto	...	457	...	457	275	732		
Sahibgarh, Patiala	...	27 1 year.	At Raniki 27	Ditto	...	...	...	...	9	9		
				TOTAL PLANTATIONS.—ACRES...		498	...	498	929	1,427		

SECOND SUB-DIVISION.

Nil.

THIRD SUB-DIVISION.

Bhowanigarh, Patiala	...	At Goojran. 19 for 3 years.	At Goojran. 19	Guggar Branch 23 miles 3,000 ft. to 28 mls. 3,200 ft.		Acres. 90	Acres. ...	Acres. 90	Acres. ...	Acres. 90	Kikar.	
Soonam, Ditto	...	At Dyalpur. 22 for 5 years.	At Dyalpur, 19	28 mls. 3,200 ft. to 29 mls 4,700 ft.		26	...	26	...	26	Ditto.	
				Mls. ft. Mls. ft.								
Bhowanigarh, Ditto	...	Ditto ...	Ditto ...	29 4,700 to 30 4,000	...	18	...	18	...	18	Ditto.	
Sooonam, Ditto	..	Ditto ...	Ditto ...	30 4,000 to 48 2,170	...	349	...	349	...	349	Ditto.	
Bhuki, Ditto	...	Ditto ...	Ditto ...	48 2,170 to 50 3,000	...	24	...	24	22	46		
Soonam, Ditto	...	Ditto ...	Ditto ...	50 3,000 to 52 1,100	...	1	...	1	31	32		
Barnalah, British	...	Ditto ...	Ditto ...	52 140 to 53 4,500	...	...	...	...	38	38		
Bhowanigarh, Patiala	...	Ditto ...	Ditto ...	Gujran Chauki	...	2	...	2	1	3	Tali, siris and bakain ...	
Soonam, Ditto	...	Ditto ...	Ditto ...	Dyalpura Do.	...	1	...	1	1	2		
Ditto, Ditto	...	Ditto ...	Ditto ...	Kotra Do.	...	2	...	2	1	3		
Barnalah, British	...	Ditto ...	Ditto ...	Sadanbas Do.	..	2	...	2	1	3		
				TOTAL PLANTATIONS—ACRES ...		515	...	515	95	610		

X.—WESTERN JUMNA CANAL, KARNAL DIVISION.

Jagadhri	...	43	35	Malikpur *via* Jagadhri road to Dadupur Dam	...	Miles. 4	Miles. ...	Miles. 4	Miles. 2	Miles. 6		
Ditto	...	...	...	Dadupur and Kharwan road including the circular road	...	4	...	4	...	4	Sembal, bignonia, siris and kaithal.	55 trees planted out in place of others blown down or otherwise destroyed.
Ditto	...	...	..	Futtehgarh bunds	...	...	...	...	1	1	...	For future operations.
Jagadhri, Pipli, Karnal and Panipat		...	35	Old canal banks right and left from Dadupur to Rer.		76	...	76	...	76	...	Some places are bare owing to old banks having been cut away by the canal.
Karnal	...	28	32	New canal banks Indri to Munak		...	...	...	31	31	...	Waiting for water.
Pipli	...	...	...	Kunjunu escape	...	20	...	20	4	24	...	Certain reaches are bare.
Karnal	...	28	32	Indri Singhoa cut	...	7	...	7	...	7		
Panipat	...	...	...	Rer escape channel	...	8	...	8	7	15	...	More or less this channel is lined with trees.
Karnal	...	28	32	Rajbaha No. III (Mill channel)		4	...	4	...	4		
Karnal and Panipat	...	...	...	Rajbaha No. IV.	...	8	...	8	34	42	...	Thirteen miles of new rajbaha should be included in next year's report.
				TOTAL AVENUES—MILES	...	131	...	131	79	210		

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rain-fall.		Locality or name of road.	Length of Road or Area.					Species of trees planted.	Remarks.
	Average.	During the year.		Planted.			Unplanted.	Total length of road.		
				In previous year.	During the year.	Total.				
				Acres.	Acres.	Acres.	Acres.	Acres.		
			Land of Tajawalla works ...	2	...	2	18	20	...	The ground is gravel, and trees are difficult to rear on it.
Jagadhri ...	43	35	Somb plantation (above Dadupur dam) ...	45	40	85	180	265	Various ...	On both sides of Somb Naddi.
Ditto ...	...	...	Dadupur station land ...	32	...	32	...	32	Catalpa and mango ...	52 catalpa trees were raised from seed and planted out during the year; also 40 mango grafts made.
Ditto ...	...	...	Patralla escape (Dadupur) plantations ...	...	...	...	...	...	...	Trees grown up. Plantations let out to graze.
			Abdullapur chauki compound ...	4	...	4	...	4	...	800 feet of entrance road unplanted.
Ditto ...	...	...	Radour chauki compound, including brickfield ...	4	...	4	3	7		
Pipli ...	...	...	Indri chauki compound ...	4	...	4	...	4		*
Karnal ...	...	...	Spoil banks, New Main Line, Indri to Munak ...	421	...	421	...	421		
Ditto ...	...	...	Rambha chauki compound ...	2	...	2	2	4	Kikar and tali ...	Was sown broadcast in 1879 with kikar and a little tali.
Ditto ...	...	...	Karnal bungalow compound (old)	4	..	4	...	4		
			Jani chauki compound ...	4	...	4	...	4		
Ditto ...	...	...	Phurlock chauki compound ..	3	...	3	...	3		
Ditto ...	...	...	Sheikhpura chauki compound ...	1	...	1	...	1		
Ditto ...	...	...	Munak chauki compound (old)	1	...	1	...	1		
Ditto ...	...	...	Munak chauki compound (new)	5	...	5	...	5		
Ditto ...	...	...	Rer chauki compound ...	6	...	6	...	6		
Ditto ...	...	...								
Ditto ...	...	...	Total Plantations—Acres ...	538	40	578	203	781		
Panipat ...	...	...								
			XI.—WESTERN JUMNA CANAL, HANSI DIVISION.							
				Miles.	Miles.	Miles.	Miles.	Miles.		
			Butanah ...	70	...	70	...	70	...	Well stocked with trees of all descriptions.
Hansi ...	2	18	Hansi ...	186	...	186	...	186		
			Mill channel ...	6	...	6	...	6		
			Bahadra ...	64	...	64	...	64		
			Darba ...	32	...	32	...	32		
			Total avenues—miles. ...	358	...	358	...	35		

XII.—WESTERN JUMNA CANAL, DELHI DIVISION.

AVENUES.

					Miles.	Miles.	Miles.	Miles.	Miles.		
Delhi	...	9 for 8 years.	30	Boundary roads ...	11	...	11	70	81	Kikar, mangos, jaman, tun and sissu. ...	The planting of avenues has been restricted till admission of water into the new canals. The work of the year was confined to filling up the numerous gaps, in which a large number of saplings were put down.
				TOTAL AVENUES—MILES ...	11	...	11	70	81		

NURSERIES AND PLANTATIONS.

					Acres.	Acres.	Acres.	Acres.	Acres.		
Delhi	...	29 for 8 years	30	Near Gurgatoli and in compound of Siraspur chauki ...	6	...	6	3	9	...	The nurseries started last year were maintained. The trees were too young to transplant.
Ditto	...	Ditto ...	30								
Panipat	...	23 for 36 do.	29	Plantations on spoil-banks of new Delhi and new Hansi canals ...	121	16	137	200	337	Kikar ...	On the 121 acres previously sown the kikar has germinated satisfactorily, except where the soil is impregnated with reh. The young trees have been thinned out, lopped and weeded.
Karnal	...	27 for 23 do.	32								
Delhi	...	29 for 8 years	30								
Panipat	...	23 for 36 do.	28	On canal land between Duryapur and Gangatoli in compound of Naraina chauki ...	...	1	1	...	1	Rheana luxurians ...	Several plots were sown with seed of Rheana luxurians in March, in accordance with directions issued by the Superintending Engineer. The most successful plots are those that were watered; the plants are now about a foot high, and about to be thinned out.
				TOTAL PLANTATIONS—ACRES ...	127	17	144	203	347		

XIII.—WESTERN JUMNA CANAL, NEW DELHI BRANCH DIVISION.

					Miles.	Miles.	Miles.	Miles.	Miles.		
Panipat	...	24	28	Delhi canal ...	150	...	150	...	150	...	Figures in column 9 include both banks of the canal. The banks are richly wooded with fine trees, some of which are 50 years old.
Sonepat	...	23	29	Hansi canal in part ...	20	...	20	...	20		
Delhi	...	27	30								
Gohana	...	22	23	Rohtak canal ...	86	...	86	...	86		
Rohtak	...	19	17	Najafgarh Jhil Drain ...	5	...	5	35	40		
				No. IX Rajbaha Main Line ...	8	1	9	21	30	Tali, tun, mulberry and jaman.	On left bank of these lines kikar has been sown broadcast.
				No. XII Rajbaha Main Line ...	3	6	9	19	28		
				TOTAL AVENUES ...	272	7	279	75	354		

XIV.—MUZUFFARGARH CANAL DIVISION.

Nil.

XV.—SWAT CANAL DIVISION.

Nil.

Proceedings of the Hon'ble the Lieutenant-Governor in the Department of Revenue, Agriculture and Commerce, (Forest),—No. 212, dated 22nd May 1882.

READ—

Report by Dr. Schlich, Conservator of Forests, on Arboriculture in the Punjab during the year 1880-81, forwarded under his letter No. 602, of 1st October 1881.

REMARKS.—The report, which is due to Government on 1st September in each year, was, owing to the late date by which certain divisional reports reached the Conservator, received in manuscript only on the 1st October. In consequence, moreover, of the severe sickness which prevailed in Lahore during the autumn, and the great pressure of current Secretariat work throughout the winter, it was not returned from Press till the 6th of April. In future, it will be submitted in print by the Conservator of Forests.

2. In form, it differs slightly from that adopted in previous years, and follows the instructions issued in the Circular of 16th March 1881, being divided into four sections, including respectively—(1) the general remarks which the district officer has to offer, (2) the description of the work done during the year, (3) the arrangements for establishment and supervision, and (4) the financial results. A tabular statement is annexed, drawn up by the Conservator, and showing the detail of each work undertaken during the year.

3. The Lieutenant-Governor is glad to be able to notice that the report indicates, in most respects, improved attention to arboriculture. There is room, however, in some cases, for the bestowal of further care on the preparation of the local reports, and district officers are again requested to note the necessity for their early submission. His Honor observes that, up to the middle of August, four divisional reports had not been received by Dr. Schlich, and that no report whatever was furnished by the Deputy Commissioners of Kangra and Dera Ismail Khan, while that submitted by the Deputy Commissioner of Ferozepore proved to be unintelligible. The officers concerned should explain these failures, which are much to be regretted, particularly in the case of Dera Ismail Khan where Major Macaulay has developed arboriculture with unusual success. The form of the reports of the present year is not, in some instances, all that could be desired; and the Lieutenant-Governor would draw the attention of officers to the very excellent model supplied by that of the Deputy Commissioner of Hoshiarpur, Mr. Coldstream.

4. The rainfall of the year was not entirely favorable for arboricultural operations; but a fair amount of progress seems to have been made in the Province as a whole. The tree plantation effected in Delhi, Karnal, Hoshiarpur, Muzaffargarh and Peshawar deserves notice; and, as large sums were spent in Amritsar and Gurdaspur, it is hoped that the results in those districts also were satisfactory. The district reports, however, are too meagre to admit of a judgment on the point. The Lieutenant-Governor remarks with pleasure, that plantation is advancing, though necessarily by slow degrees, in the thirsty districts of Rohtak and Hissar. A comparison of the amounts disbursed in adjoining districts with the amounts spent in Umballa, Jullundur and Gujrat suggests that the attention there paid to the subject is scarcely sufficient. In Rawalpindi also the outlay was trifling; and if the dry weather was an obstacle to planting, more money might certainly have been laid out with advantage in watering standing trees.

5. The expenditure on district arboriculture during the year amounted to Rs. 1,05,695, and the receipts to Rs. 29,875. Of the amount realised nearly Rs. 22,000 were due to the sale of timber and the loppings of trees; and, on the whole, there appears to be reason to hope that the financial results of arboriculture will, in the course of some years, greatly improve. The income varies very much from district to district; and realizations ought certainly to be

obtained or improved at such places as Lahore, Amritsar and Mooltan. There was a surplus only in the Jullundur and Hoshiarpur districts; in Sialkot there was a near approach to equilibrium; while, among other districts, Delhi, Umballa and Ludhiana show a considerable income, though there is still, in each case, a large deficit.

6. Doubtless, as is pointed out by the Deputy Commissioner of Rohtak, arboriculture has hitherto been very unsystematically prosecuted in many districts. The Lieutenant-Governor thinks that if the objects of the annual report are properly comprehended, and efforts are made to give effect to them, the development of tree-plantation will more and more rarely depend upon the interest which happens to be taken in the subject by the Deputy Commissioner for the time being. At all events, every Deputy Commissioner will have before him the reports of his predecessors in past years to guide him in his operations. As a further means of securing continuous progress, the Lieutenant-Governor accepts the suggestion made in paragraph 3 of the Conservator's forwarding letter, and desires that the district reports for next year may include lists of the avenues which should be gradually formed and a general sketch of the plan of proposed planting operations in each district. The Lieutenant-Governor also approves the remarks of the Conservator on the necessity of considering the requirements of outlying parts of the district, which should not be overlooked for the sake of improving the roads and gardens at head-quarters.

7. It is satisfactory to notice that some native officials engaged upon arboriculture have been sent from districts to receive a course of instruction at the Changa Manga plantation. In the review of the arboriculture report of 1878-79, Sir R. Egerton expressed a hope that District Committees would avail themselves, as far as possible, of the opportunity of training subordinates in this way. Sir Charles Aitchison would be glad to see still more advantage taken of it.

8. The experiment of planting out and protecting roadways across the "chohs" in the Hoshiarpur district, which was alluded to in the review of last year, has not been mentioned in the district report for 1880-81. The Lieutenant-Governor will be glad to receive informationon the subject in future reports.

9. The expenditure on canal arboriculture, and the income received during the year, were much the same as in 1879-80. The cost of planting trees on the Upper and Lower Sutlej inundation canals, which run through an almost rainless country, is no doubt considerable; but, inasmuch as in such tracts successful arboriculture is only practicable along canals or round wells, the Lieutenant-Governor considers that efforts to grow trees on the canal banks should not be lightly abandoned. The same remarks apply to the Muzaffargarh canal division; and it is hoped that it will be found possible this year to make a grant for plantations on the inundation canals of that district. The opening of the Sirhind Canal will no doubt be followed in a few years by the formation of groves and avenues in a part of the Punjab which is at present singularly bare of trees.

10. His Honor trusts that it will some day be practicable to publish a hand-book on arboriculture for the guidance of district officers. Meanwhile, all officers can gather much useful information from the annual reports; and, as a further guide to those who have no special knowledge of, or taste for, the subject, the Conservator is requested to prepare, for circulation to district officers, a descriptive list of trees likely to succeed in various parts of the Punjab on the model of Appendix II to the Report on Arboriculture in the North-Western Provinces for 1879-80. The tabular statement, annexed to the Punjab Report, need not be printed in future years, unless the Conservator is prepared to show that the expense and delay involved in its publication lead to some commensurate advantage.

ORDER.—Ordered that the Report, together with this review, be circulated as usual.

Ordered also that a copy be forwarded to the Government of India, Department of Revenue and Agriculture.

By order of the Hon'ble the Lieutenant-Governor,

C. L. TUPPER,

Junior Secretary to Government, Punjab.

Printed at the Punjab Government Civil Secretariat Press, Lahore.—26-5-82—250.

PROGRESS REPORT

OF

DISTRICT AND CANAL ARBORICULTURE,

IN THE

PUNJAB

FOR

1881-82,

COMPILED BY

MAJOR G. J. VAN SOMEREN, M. G. L. I.

CONSERVATOR OF FORESTS;

WITH A REVIEW BY H. H. THE LIEUTENANT-GOVERNOR OF THE PUNJAB.

Lahore:

PRINTED AT THE "CIVIL AND MILITARY GAZETTE," PRESS.

1882.

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Proceedings of the Hon'ble the Lieutenant-Governor of the Punjab, in the Home Department (Forests), No. 105, dated 20th March 1883.

READ—

The Report on Arboriculture in the Punjab during the year 1881-82, submitted by Major Van Semeren, Officiating Conservator of Forests, under his letter No. 149 of 14th October 1882.

REMARKS.—The Report, which was otherwise complete early in August, was delayed for two months by the late submission of the returns of the Umballa Division, which is stated to have been caused by the neglect of the Deputy Commissioner of Ludhiana to furnish the necessary statements for his district. No satisfactory reason, however, is alleged for the delay on the part of Mr. Wakefield, and no explanation is offered as to why it was not as easy for that officer to submit the report in July as in October. In the case of such delays in future the Lieutenant-Governor will be compelled to take serious notice of the action of the officer concerned.

2. The printing of the Conservator's Report at the Central Jail Press further retarded its submission to Government, and, as in the case of the Cotton Report for last year, it has been unfortunately still further delayed in the Secretariat Office. For these reasons, and because the report of last year was reviewed at the end of May only, and the summary of the present report is somewhat unsatisfactory in its character, the Lieutenant-Governor does not propose to enter on adetailed notice of its contents.

3. The expenditure on arboriculture by District Committees during 1881-82 is stated to have been Rs. 1,05,695, and the receipts Rs. 29,875; the net cost of maintaining and reproducing trees amounted therefore to Rs. 75,280. The districts which show the largest income are Jullundur, Hoshiarpur, Sialkot, Delhi, Ludhiana, Karnal, Jhelum and Amritsar, of which the first three also exhibit a net income over and above the expenditure incurred. It would appear that the receipts from the sale of the loppings of trees and from fellings cannot always be properly brought to book, as during the past two years no income has been entered in the case of the Gujrat, Mooltan, Montgomery, Dera Ghazi Khan and Dera Ismail Khan districts, although it would seem certain that in the first district and in the last two some income must have been received. This should be explained by the Deputy Commissioners of the districts named in their next annual report; and information should also be given by the officers concerned as to why the income in Gurdaspur and Lahore is so small. It appears hardly possible that the income from this source in the last district should be less than that derived in Gujranwala.

4. Good work appears to have been done or commenced during the year in the Hoshiarpur, Delhi, Sialkot, Kangra, Muzaffargarh, Dera Ghazi Khan, Dera Ismail Khan and Peshawar districts, from most of which satisfactory reports have been received. The reports from Ferozepore and Montgomery, and from all the districts of the Rawalpindi Division, are, however, very meagre and poor, and the attention of the Commissioners of the Lahore, Mooltan and Rawalpindi Divisions is invited to this point; the reports from the Umballa Division are also unsatisfactory. The thanks of the Lieutenant-Governor are due to Colonel Davies, C. S. I., Commissioner of the Jullundur Division, for the interest shown by him in arboriculture; and His Honor will be glad if all Commissioners will give their attention to systematizing the efforts made by District Officers in this direction.

5. Care appears to have been bestowed on the subject of pruning and lopping trees in many districts; and the increased interest taken in the subject of arboriculture by Deputy Commissioners has in some cases led to greater attention on the part of the subordinate revenue establishment. Much, however, still remains to be done in these respects, and to arouse the people to a sense of the advantages of growing trees. It may be hoped, however, that the development of the policy of local self-government will add an impetus to

the interest already taken by the people in the subject in the Sialkot, Dera Ghazi Khan and other districts, and will induce wealthy persons to come forward and plant groves and avenues as an act of piety or public benefit, as is reported to have been done in two instances in the Delhi district during the past year.

6. The experiments made in connection with the Hoshiarpur chhos, and which are detailed at page 20 of the district reports, are interesting, and the Lieutenant-Governor will be glad to see the subject mentioned in future years.

7. With reference to the preparation of the annual returns of arboricultural operations, the attention of all officers is invited to the remarks of the Conservator in paragraph 11 of his report.

Deputy Commissioners are further requested to note briefly in their district reports for 1882-83 the working plan proposed by them for guidance hereafter, as was desired in paragraph 6 of the Review of last year.

8. The expenditure on canal arboriculture during 1881-82 amounted to Rs. 32,541 as against an income of Rs. 46,392. A large number of trees were planted on the Kasur and Sobraon branches of the Bari Doab Canal, and on the new distributaries of the Western Jumna Canal; and now that water has been turned into the Sirhind Canal, arboricultural operations will be prosecuted more vigorously along its banks. It appears that at present the operations of the General Branch of the Department Public Works in planting trees along the lines of road which are under its charge are not included in the Provincial Report. It is not clear why this should be the case; and the Secretary to Government, Department Public Works, will be asked to state if there are any reasons why reports should not be furnished by the General as well as by the Irrigation Branch.

9. The Lieutenant-Governor is not aware whether any action has been taken by the Conservator in connection with paragraph 10 of last year's Review. His Honor would be glad if Mr. Ribbentrop would now put the preparation of the list required into hand as soon as possible, in order that it may be circulated to District Officers without further delay.

ORDER.—Ordered, that the above Review be printed as usual and published with the Report.

Also that it be published in the *Punjab Government Gazette.*

Also that it be forwarded with the usual number of copies of the Report to the Secretary to the Government of India, Department of Revenue and Agriculture.

Also that a copy be forwarded to the Secretary to Government, Department Public Works, with reference to the remarks in paragraph 8.

By order of the Hon'ble the Lieutenant-Governor,

C. L. TUPPER,

Junior Secretary to Government, Punjab.

Printed at the Punjab Government Civil Secretariat Press, Lahore.—7-4-83.—225.

No. 149 C. L., dated Simla, 14th October 1882.
From—Major G. J. VAN SOMEREN, Conservator of Forests, Punjab.
To—The Junior Secretary to Government, Punjab.

I have the honour to submit Progress Report of District and Canal Arboriculture for the year 1881-82.

Weather.

The rainfall of the year throughout the Province was on the whole favourable to arboriculture. In the Delhi Division it was insufficient, and ceased early, especially in part of the Gurgaon District, but the ensuing winter was mild.

In Rawalpindi, Jhelum, Kohat and Lahore Districts it was also insufficient; while in Hoshiarpur and Sirsa Districts it was very good. In all the other districts the weather was normal, with the exception of some destructive storms in the Hissar Division, which caused great damage to trees, especially in the Rohtak District where, in the station itself, upwards of a dozen fine trees were twisted by the violence of the wind, and snapped off at about 12 feet from the ground; and on the Delhi-Rohtak Road upwards of 50 trees were thus broken, and large branches were torn off many others.

Methods of raising trees.

2. As a rule, the trees afterwards planted out in avenues and groves are raised in nurseries, and finally transplanted when from one to three years old. In the east of the province Kikar hedges thrive well if properly sown and cared for.

The Commissioner of the Delhi Division points out that the method adopted by the tahsildars of sowing the seed in trenches often fails, as the seedlings are drowned in the rains. He very properly advocates the plan adopted by the Customs Department of sowing the seed on raised embankments, and describes the Customs hedge in many parts of Gurgaon as a "real glory to the neighbourhood."

3. In Rohtak, the Deputy Commissioner adopted with success a plan proposed by Mr. Down, Assistant Conservator, of setting out root cuttings in worked earth. This method has also succeeded in Changa Manga plantation, and might be followed elsewhere where the want of water and insufficient rainfall kill off transplanted trees.

4. Much attention and care seems to have been bestowed throughout the Punjab generally in maintaining, filling up blanks in, and adding to, the number of, nurseries and avenues. The very varying climatic conditions preclude equal results following on equal pains, and the reports from the Multan Division and parts of Hissar are somewhat disheartening.

Proposal to plant groves in lieu of avenues.

5. Where so much difficulty is experienced, as reported from Multan especially, in raising avenues, it would be well to give up the attempt to maintain a long and broken line of scraggy trees, and instead thereof to plant groves along the roads.

It would then be practicable to utilize wells for irrigation, and the money spent would probably be spent to more purpose, while if the sites for such groves were carefully selected, they would in time form convenient resting places for travellers during the heat of the day, and also afford some protection from heavy night dews. In the Mozaffargarh District all the important towns are situated on four principal roads from which the cross roads branch. These roads are :—

(1.) Sher Shah to Dhera Ghazi Khan.
(2.) Mozaffargarh to Alipur.

(3.) Mozaffargarh to Rangpur.

(4.) Mozaffargarh to Ahsanpur *viâ* Mahmud Kote,

and the plan now proposed might perhaps be tried on them.

6. Indeed, if groves were established throughout the province near roads, they would probably be found very useful and remunerative. It would be easier to supervise the work where many trees are grown in one spot, sales of loppings and old wood would bring in more money, the crop of fruit trees would be more valuable, and as encamping grounds the convenience of such groves would be very great. As in the Punjab camels are used so much, it would be well to also grow a number of fig trees and other trees for the purpose of yielding fodder for camels, the fodder being sold.

Agency employed.

7. The agency ordinarily employed is the tahsildars', with a staff of bhistis and gardeners and, in some places, pruners are added. Pruning a young tree is a delicate operation, and unless the men to whom the duty is entrusted are given some instruction, they may often do more harm than good. On the other hand, pruning of trees placed far apart, as in avenues, is wanted and this is prominently referred to by the Commissioner of the Delhi Division, who specially mentions the necessity that exists for pruning trees in certain roads within Delhi Municipal limits. Much attention appears to have been bestowed in the Hoshiarpur District on this important part of road arboriculture, and the men employed on it are first instructed and then carefully supervised, with good results ensuing,

Enlisting interests of agricultural population.

8. In some districts the Deputy Commissioners have enlisted the services of leading zamindars in extending planting operations. This is a great matter, and where the local agriculturists really interest themselves in the work, it will be made much easier and cheaper. But as the Commissioner of Jullundhur points out, such aid, however valuable as an auxiliary, cannot altogether replace Government agency.

From Sialkot District it is reported that the people seem to have a natural taste for tree planting, and that they have of late years done much in both arboriculture and horticulture.

In Hazara, the Deputy Commissioner reports that trees are distributed gratis, and that, judging by the growing demand for them, zamindars are beginning to appreciate the advantages of arboriculture.

9. The interest of the country folk appears to be at the minimum point in Multan Division, and the attempt made in the Multan district to secure the co-operation of zamindars, by paying two annas three pies for every tree alive at the end of the year, failed. The District Committee has therefore determined to limit its operations to the maintenance of existing avenues, and to encouraging zamindars by free distribution of seeds to grow trees on their holdings and close to the roads. This district presents a fair field where the experiment of planting groves might be tried.

Returns of work done.

10. The tabular statement now given presents in a compressed shape the detailed information from each district. In para. 10 of the review by the Punjab Government of the Report for 1880-81, the Conservator was allowed a certain discretion in again printing, or not printing, a statement similar to that annexed to last year's report,

The expense and delay incurred in printing it will not, it is thought, lead to any commensurate advantage, and it is therefore omitted,

Statement showing the Avenues and Groves planted in the several Districts of the Punjab, with Financial results, during the year 1881-82.

Division.	District.	Length of Avenues planted in miles.			Groves, nurseries and plantations in acres.			Financial Result in Rupees.				Remarks.
		In former year.	During 1881-82.	Total.	In former year.	During 1881-82	Total.	Receipts.	Charges.	Surplus.	Deficit.	
		Miles.	Miles.	Miles.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	
Delhi	Delhi	137	50	187	804	...	804	5,875	11,006	...	5,131	
	Gurgaon	83	33	116	25	...	25	720	4,073	...	3,353	
	Karnal	47	8	55	314	...	314	314	5,461	...	5,147	
Hissar	Hissar	60	15	75	43	18	61	287	4,662	...	4,375	
	Rohtak	89	9	98	83	2	85	193	4,417	...	4,224	
	Sirsa	94	...	94	154	1	155	52	571	...	519	
Amballa	Amballa	106	...	106	...	...	...	1,470	2,590	...	1,120	
	Ludhiana	75	8	83	12	...	12	2,150	4,140	...	1,990	
	Simla				No arboriculture in the Simla District.						...	
Jullundhur	Jullundhur	140	19	159	Information not given.			4,084	1,624	2,460		
	Hoshiarpur	256	8	264	344	78	422	6,441	6,228	213	...	
	Kangra	289	52	341	2	1	3	250	650	...	400	
Amritsar	Amritsar	92	14	106	25	...	25	1,753	7,933	...	6,180	
	Gurdaspur	382	1	383	70	...	70	946	4,226	...	3,280	
	Sialkote	332	...	332	30	...	30	4,412	2,737	1,675	...	

Statement showing the Avenues and Groves planted in the several Districts of the Punjab, with Financial results, during the year 1881-82.—Continued.

Division.	District.	Length of Avenues planted in miles.			Groves, nurseries and plantations in acres.			Financial Result in Rupees.				Remarks.
		In former year.	During 1881-82.	Total.	In former year.	During 1881-82.	Total.	Receipts.	Charges.	Surplus.	Deficit.	
Lahore ...	Lahore	58	4	62	Information not given.			330	2,010	...	1,680	
	Ferozepur	382	43	425	249	80	329	Not given.		...	...	
	Gujranwalla	102	2	104	8	...	8	216	3,333	...	3,117	
Rawalpindi ...	Rawalpindi	344	5	349	None.		...	65	623	...	558	
	Jhelum	90	22	112	1	...	1	1,704	5,381	...	3,677	
	Gujrat	30	10	40	None.		...	...	574	...	574	
	Shahpur	10	17	27	32	370	402	451	3,910	...	3,459	
Multan ...	Multan	105	2	107	7	20	27	...	2,115	...	2,115	
	Jhang	...	...	...	369	5	374	500	3,676	...	3,176	
	Montgomery	10	2	12	29	...	29	...	1,402	...	1,402	
	Muzaffargarh	45	8	53	72	25	97	1,134	9,091	...	7,957	
Derajat ...	Dera Ismail Khan ...	31	11	42	11	...	11	...	1,691	...	1,691	
	Dera Ghazi Khan ...	56	7	63	13	20	33	...	4,938	...	4,938	
	Bannu	40	1	41	12	...	12	114	1,137	...	1,023	
Peshawar ...	Peshawar	119	7	126	...	12	12	50	4,652	...	4,602	
	Hazara	20	17	37	93	3	96	1,967	2,633	...	666	
	Kohat	4	5	9	...	...	...	...	402	...	402	
	Total ...	3,628	380	4,008	2,802	635	3,437	35,478	1,07,886	4,348	76,756	

Net deficit Rs. 72,408

Require checking.

11. According to the figures submitted by District Officers, 380 miles of avenues were planted during the year, and the previous length planted being returned as 3,628 miles, the resulting total is 4,008 miles; and in ordinary course that total should be the opening balance for the next report. But there is reason for thinking that it would be misleading. For instance, the Loodhiana district shows 8 miles as planted during the year, but a reference to the report itself shows that, with a few exceptions, the trees were planted in the same places where trees had died out. Again, Ferozepur shows 43 miles planted out during the year. In the body of the District Report it is thus written—"trees planted on roadside 18,719, whereof 5,924 have died." This leaves 12,795 living trees, and these distributed over 43 miles give 297 per mile. To plant a road with an avenue of trees, at 15 feet apart, requires for each side of the road 372 trees, or altogether 744 per mile. The matter requires to be looked into, or at this rate it may result that after a few years the Punjab will possess (on paper) more miles of avenues than there are miles or roads to plant them on.

A careful inspection of all roads and classifying them as fully planted, half planted, and to be planted, would not only result in more accurate returns but would furnish data for the "list of avenues which should gradually be formed," called for in para. 6 of the Government review on the report for 1880-81. This list and "the general sketch of the plan of proposed planting operations in each district," are not referred to in the great majority of the reports. That from Sialkote, in its para. 9, affords information on the point.

12. The total extension of groves and nurseries during the year is returned at Rs. 635 acres, not quite one square mile, resulting in a total planted area for the whole province of under 6 square miles.

Financial results.

13. The financial results show an expenditure of Rs. 107,886 and an income of Rs. 35,478, leaving a net expenditure of Rs. 72,408.

The figures for 1880-81 were—

Charges	...	1,05,695
Receipts	...	29,875
Net expenditure	...	75,820

Three districts only showed a surplus, Jullundhur Rs. 460, Hoshiarpur 213, Sialkote 1,675.

Introduction of good fruit trees and vines.

14. In Sialkote, in Jhang, and in Dhera Ghazi Khan much interest was taken in the very important work of introducing and encouraging the cultivation of vines and good fruit trees, and one or two other districts did a little in the same way. The Commissioner of Amritsar is desirous of introducing the better kinds of plantains into the Punjab, where the plantain that is now produced is a very poor one. The experiment is well worth trying, for a good plantain is both nutritious and pleasant to the taste, but it is not likely that the plantain will succeed in localities so far north and, at the same time, so far removed from the influence of sea air.

General.

15. In Hoshiarpur district a new encamping ground was laid out at Damsuah between Unah and Mahilpur, and the planting of old encamping grounds, of which there are 14, was attended to.

16. A good deal was also done in planting out Nara *(Malva Parviflora)*, Munj and Kahi grass for the purpose of protecting roadway embankments. Other districts might well follow this example.

17. The operations for the reclamation of the "Cho" below Hoshiarpur were continued, and Munj grass and Nara were planted out over 50 acres. The results hoped for are *(i)* Protection to certain low-lying Mohallas of the town from floods, *(ii)* The diversion of the channel of "Cho" which, if unchecked, threatens the existence of the town. The work must be persevered in for five or six years, and looking at the results already achieved elsewhere, success may be fairly anticipated.

18. There are 171 Kikar plantations varying in size from 5 to 10 acres in the Jhang district. These are the property of zamindars who were encouraged to plant them to supply wood to the river steamers. They are entered in the settlement papers as in possession of Government. The Deputy Commissioner thinks it would be well to select some of the better plantations, to purchase them from the zamindars and, gradually cutting out the Kikar, plant them out with Shisham. The Commissioner supports the proposal and asks for special orders on it. On this it may be remarked, generally, that as Shisham requires a good supply of water to thrive well, it is presumed that water can be had, and if so there is no doubt that the trees can be easily raised. The local officers can decide best whether such small plantations will pay.

19. The Gurgaon District Committee had sent a man to be trained at Changa Manga, but he on his return showed himself "incorrigibly idle," and the Commissioner thinks it best to dismiss him.

In Shahpur district a man trained at Changa Manga joined towards the end of the year; and another man was sent by the Deputy Commissioner to be trained.

20. The reports from the Delhi, Hissar, Jullundhur and Peshawar Divisions are interesting, so are those from the Sialkote, Jhang, Dhera Ghazi Khan and Mozuffargarh Districts.

21. This report was delayed by the late receipt of papers from one or two divisions. The Amballa Division report did not reach the Conservator till the 11th October.

22. As the divisional and district reports are printed in full, it is suggested that much time and inconvenience would be saved if these reports were in future written on one side of the page only.

23. Some information is afforded by the Lahore and Delhi Municipalities, and it is printed in full with other reports. On the whole, the prospects of growing *Eucalyptus* at Delhi are not good, and except as interesting specimens in public gardens, it would perhaps be better to spend money on useful indigenous trees.

II.—CANAL ARBORICULTURE.

24. The results are shown in tabular form.

Part II.

Statement showing the Avenues and Groves planted with Financial results during the year 1881-82.

DIVISION.	Length of Avenues planted in Miles.			Groves & plantations in Acres.			Financial Results in Rupees.				Remarks.
	In former years.	During 1881-82.	Total.	In former years.	During 1881-82.	Total.	Receipts.	Charges.	Surplus.	Deficit.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Baree Doab Canal, 1st Division	242	38	280	1,460	27	1,487	6,079	14,728	...	8,649	
,, ,, ,, 2nd ,, ...	155	...	155	...	53	53	8,057	4,013	4,044	...	
Upper Sutlej Inundation Canals	301	...	301	None	...	...	2,374	3,022	...	648	
Lower Sutlej and Chenab Divisions, Indus Canals ...	580	...	580	98	...	98	14,037	1,198	12,839	...	
Indus Canals, Dera Ghazi Khan Division	106	9	115	41	...	41	2,250	2,650	...	400	
Sirhind Canal, Main Line Division	...	...	...	956	580	1,536	850	1,027	...	177	
Ditto, 3rd ,, ...	128	6	134	1,358	386	1,744	...	728	...	728	
Ditto, 4th ,, ...	8	...	8	65	...	65	...	89	...	89	
Ditto, 5th ,, ...	...	...	...	496	...	496	...	...	...	..	
Western Jumna Canal, Karnal Division	130	16	146	512	9	521	1,545	908	637	...	
,, ,, ,, Hansi ,, ...	...	6	6	...	...	...	4,338	2,031	2,307	...	
,, ,, ,, Delhi ,, ...	288	21	309	...	...	...	6,862	1,401	5,461	...	
,, ,, ,, New Delhi Branch Division ...	11	...	11	118	...	118	...	266	...	266	
Muzzaffargarh Canals Division	...	...	...	...	...	...	...	480	...	480	
TOTAL	1,949	96	2,045	5,104	1,055	6,159	46,392	32,541	25,288	11,437	

Note.—Net Surplus Rs. 13,851.

25. It will be seen that the District and Canal financial results were—

Charges	...	...	...	Rs.	1,40,427
Receipts	...	...	...	„	81,870
			Net expenditure	„	58,557

SIMLA:
The 14th October 1882.

G. J. VAN SOMEREN, MAJOR,
Conservator of Forests, Punjab.

I.—DISTRICT ARBORICULTURE.

DELHI DIVISION.

Remarks by Commissioner.

General Remarks.—The year under report does not seem to have been entirely favorable to tree-planting, as the insufficient rainfall, especially in parts of the Gurgaon District, and its early cessation, prevented young trees, planted out in July and August, from thriving as they should have done.

Description of Work.—The work done in each district is fully described in the reports. The division is generally well wooded, especially the Delhi District, and not much in the way of extension of avenues on the road side remains to be done.

The careful filling of blanks in existing avenues seems to be the point to which attention should be chiefly directed, and the pruning and sale of such trees and branches as may with advantage be removed.

This is a matter in which the Municipality especially seem to me less active than is desirable. The trees on Hamilton Road, the Queen's Road and in the Chandni Chauk all want liberal pruning, and many might be removed with advantage.

On the subject of sowing kikar hedges, which thrive so well in this part of the world, but which so often fail as usually sown by the Tahsildars, I think we should take a hint from the Customs Department whose hedge is, in many parts of Gurgaon, a real glory to the neighbourhood, and which attains to handsome proportions in some 3 years. When at Nuh lately, I observed that instead of the seed being sown in *trenches,* as is universally done by Tahsildars, a small "Daul" or embankment is formed, say 2 feet wide and a foot high and flat at the top, and the seeds are sown diaper fashion on the top of such Daul, and are thus saved from swamping in the rains.

Establishment.—The following figures give the expenditure under the head of Establishment for each District for the past two years.

		1881-82	1880-81.
Delhi District ...	... Rs.	2,072	5,748
„ Municipality ...	... „	3,914	3,372
Gurgaon	... „	3,463	3,216
Karnal	... „	3,346	3,084
Total	... „	12,795	15,420

The only remark I have to make is that the expenditure during last year in the Delhi District is less than half what it was in the previous year.

Supervision.—In the Delhi District a forester is maintained at the two Government plantations of Tilauri and the Bela on a salary of Rs. 25-0-0 each, and a similar official, of whom the Depty Commissioner speaks very badly, has lately been entertained in Gurgaon. If the man is "incorrigibly idle" it would seem desirable to get rid of him without further delay, and appoint a better man.

The Tahsildars, however, are the best agency for supervision, properly so called, if they have any taste for arboriculture or any zeal; and, under them, the Zaildars and members of the District Committee can render very effective aid if their services are freely availed of, and tact shown in interesting them in the work of tree-planting in their neighbourhood.

The following table exhibits the expenditure and income during the past two years in the Division :—

Districts.	Years.	Income.	Expenditure.	Difference.
Dehli	1880-81	4,538	7,554	3,016
	1881-82	5,875	11,007	5,132
Gurgaon	1880-81	403	3,095	2,692
	1881-82	720	4,073	3,353
Karnal	1880-81	121	5,377	5,256
	1881-82	314	5,461	5,147
Total.	1880-81	5,062	16,026	10,964
	1881-82	6,909	20,541	13,632

It will be observed that the figures show an increase under both heads Income and Expenditure in all 3 Districts, indicating more activity in tree-planting, and better results from the sale of wood, &c., and these are satisfactory symptoms, although there is a deficit resulting from the operations on the whole.

1.—DELHI DISTRICT.

A.—Deputy Commissioner's Report.

General Remarks.—The rainfall was below the average, and was unequally distributed. This was rather unfavourable for tree-planting; besides the hot winds and white-ants destroyed many seedlings and young trees. On the whole, however, very fair results have been obtained.

Description of Work.—An account of arboricultural operations within Delhi Municipal limits has been supplied by the Secretary Municipal Committee, and a copy of his report is annexed.

Outside Municipal limits fair progress was made in tree-planting under the supervision of the District Committee and Tahsildars.

Good avenues already exist or are in an advanced state of formation on the following imperial roads:—

(1). Grand Trunk Road between Delhi and Karnal,
(2). Delhi and Mathra road,
(3). Delhi and Rohtak road,
(4). Delhi and Gurgaon road *via* Mahrauli;

and on the two canals—the Western Jamna and Okla—which traverse almost the entire length of the district from north to south.

There are also well grown avenues on the roads between Safdar Jang and Humayun's tomb and between Delhi and Azadpur.

On the following roads trees have been planted during the last few years, with more or less success:—

(1.) Bahalgarh and Sonepat.
(2.) Sonepat and Lursowli.
(3.) Delhi and Najafgarh.
(4.) Faridabad branch roads north and south,
(5.) Mahrauli and Badarpur, and
(6.) Toghlakabad and Kalka road.

In the statement attached to the report for 1880-81, 137 miles were returned as planted, of which 24 miles were planted during that year. During 1881-82 these miles were maintained and looked after, and about 700 blanks were filled with trees obtained from the nurseries. They are all thriving, with a few exceptions, and the trees have attained a height of from 3 to 8 feet.

During the year under report, 49½ miles of road were planted, 43½ miles being sown with Kikar seed, and 6 miles were planted with young trees of various kinds. The work done was as follows:—

	Kikar seed sown in trenches.
Delhi Tahsil—	
Delhi—Najafgarh Road	8 miles
Ballabgarh Tahsil—	
Badarpur—Mahrauli Road	3 miles
Ballabgarh—Chhaensa Road	6 „
Faridabad—Majháoli Road	3 „
Sikri—Chhaensa Road	9 „
Atali—Faridabad Road	10 „
Sonepat Tahsil—	
Murthal Road	3 miles
Thana Kalan Road	1 „
Thana Khurd Road	½ „
	43½ miles

	Trees planted in
Old Cantonment—Burárí Road	2 miles
Delhi City and Civil lines Roads	3 ,,
Sonepat—Bahalgarh Road	2 Furlongs
Circular road round Sonepat	6 ,,
	6 miles
	49½ miles

The attempt to raise avenues on minor district roads by sowing Kikar seed in trenches is more successful than planting trees, and it is less expensive, and requires less supervision.

A large portion of the seeds are destroyed by the hot winds or frost after germinating, but by continuing the process year after year, and filling up blanks, a good avenue is ultimately obtained at but little cost.

Nurseries and Groves.—Of the seven nurseries in the district that at Mubárik-bágh is the best. 750 trees were taken out of it for distribution. Táli and Kikar seed was sown in it. 1,200 trees of the previous years' sowings, and 800 the produce of the sowing of the year under report, are in good condition. The nursery at Tatárpur has been closed. 500 trees were taken out of it for distribution. About a hundred more are left. The other nurseries supplied trees for the Police Road-post, and roads close to them, and fresh seed was sown in them.

Police Buildings.—415 trees were planted during the year in addition to 4141 of previous years, around some of the Police outposts. They are carefully looked after. The following extract from a report by the District Superintendent of Police describes the progress made during the year in the plantation and maintenance of groves at Police stations, rest-houses, and road-posts;—

Description of Work.—"It has not been necessary to do much planting during the past year, as nearly all the trees which were planted at the various Police Stations, &c, in 1880 and previous year were found to be in a thriving condition this year; therefore all that had to be done was to plant groves at Najafgarh and Mahrauli, where none existed, and to supply a few trees to replace those which died during the year. There are three nurseries at Chhaensa, Faridabad and Rai, and all trees required are obtained from them. The percentage of trees planted successfully is 90 per cent."

Establishment and Supervision.—" Four mális and 8 bhistis are employed on the plantation at the various Police Stations and Posts, the latter however for only 7 months in the year. The officers in charge of the various stations and posts where groves exist, exercise a supervision over them. The pay of each máli and bhisti is Rs. 4 "

Financial Results.—"The total expenditure during 1881-82 for arboriculture was Rs. 388; and the amount realized by the sale of trees was Rs. 13. Balance Rs. 375."

Nothing was done in the Tilauri Rakh. The grounds are leased for grazing purposes.

Encamping Grounds.—Nothing was done in these during the year. The soil of most of the encamping grounds, especially those on the Grand Trunk Road, is largely impregnated with shor, and is unsuitable for tree-planting or cultivation of any sort.

The Secretary, Municipal Committee, has submitted a report on the experimental growth of *Eucalyptus* seed in the station gardens at Delhi. The following is an extract:—

"With reference to your No 647 of the 31st ultimo, I have the honor to report the result of the experiments made during the past year with the seed and seedlings of *Eucalyptus* obtained from Lahore."

"The Revd. James Smith who is in charge of the Queen's garden states that in these gardens there are about 20 healthy plants one foot high, partly in pots and partly in the open ground. Several trees of the same tribe, the remains of a former experiment, are living. The *Eucalyptus globulus* grew to a considerable height, but being planted on level ground died in the rains. Mr. Smith gives it as his opinion, that the extreme heat and moisture of the Delhi climate are unfit for the *Eucalyptus* or any of its varieties, though on the Canal banks and raised ground there is no difficulty in keeping the trees alive, and he concludes by stating that he is convinced from the result of a good deal of practical experience that the *Eucalyptus* is unfit for Delhi."

" In the Kudsia garden the Honorary Secretary reports that the seeds and seedlings were sown and planted, but the result was not as successful as was anticipated, owing to a want of Canal water. The young plants that had germinated successfully from seeds sown in flower pots perished soon after being transplanted into the small nursery bed, and only four of the plants were saved."

" The officer in charge of the Roshnara garden states that twelve of the *Eucalyptus* plants sent to the gardens in April last are thriving and doing well. From seeds sown later on, several good plants were produced, so that in all there are 21 plants living, all of which have attained a height of four feet."

" When young the plants are exceedingly delicate, and require constant care and attention in watering and protection from weather. Further experiments are being made in the three large gardens, and it is expected that next year the result will be highly satisfactory."

Establishment and Supervision.—The establishment employed for the different works in this district costs Rs. 5,985-13-4 during the year, and it consists of the following staff :—

		Rs.	A.	P.
3	Foresters and jamadars costing	696	0	0
7	Peons	420	13	4
2	Chowkidars	120	0	0
1	Sweeper	48	0	0
35	Málís	1,751	0	0
4	Beldars	240	0	0
41	Bhistis and pakhális	2,710	0	0
	Total Cost ...	5,985	13	4

A detailed statement of these establishments shewing their distribution on the several district and municipal roads and plantations is annexed. Each Tashildar is responsible for arboricultural operations within his tahsil. He is assisted by the road-overseers, Zaildars, and members of the District Committee. His work is also inspected by the district officers during their tour of inspection.

Financial Results.—The financial results were as follows:—

	Rs.	A.	P.
INCOME.			
Sale of grass and grazing fees	3,851	1	1
Sale of decayed trees	1,993	1	7
Boat contract	31	0	0
Total income	5,875	2	8
EXPENDITURE.			
Establishments	5,985	13	4
Planting operations	736	0	0
Subscription to the Agri-Horticultural Society, Punjab	120	0	0
Cost of brick enclosures	1,226	2	7
Repairs to jaffries	152	9	3
Clearance of weeds in Bela plantation	2,700	0	0
Miscellaneous	86	0	0
Total charges	11,006	9	2
Deficit	5,131	6	6

The above income and expenditure include the receipts and outlay of the Delhi Municipality, the Bela plantation, the Tilauri rakh, and the District arboriculture.

Detail of Arboriculture Establishment.

Name of road or plantation.	Detail.	Amount.	Total for year.
		Rs.	Rs. A. P.
Humayun and Safdarjang Road.	1 Jamadar at Rs. 8 per mensem ...	96	
	1 Peon „ „ 5 „ ...	60	
	1 Bhisti „ „ 5 „ for 11 months ...	55	
			211 0 0
Delhi-Najafgarh Road.	4 Beldars at Rs. 5 each per mensem ...	20	
	1 Mali „ „ 5 „ „ ...	5	
	2 Bhistis „ „ 7 „ „ ...	14	
	1 Do. „ „ 7 „ for 10 months ...	7	
	2 Chowkidars at Rs. 5 each per mensem ...	10	
		56	
	For the year after deductions of sorts ...	...	654 11 1

Detail of Arboriculture Establishment.—(continued).

Name of road or plantation.	Detail.	Amount.	Total. for year.
		Rs.	Rs. A. P.
	Brought forward ...	...	654 11 1
Sonepat-Bahalgarh Road.	2 Malis at Rs. 4 each per mensem ...	8	
	2 Bhistis at „ 7 „ „ for 10 months	14	
	2 Do. at „ 7 „ „ for 1 month	14	
	For the year after deductions of sorts ...	...	239 9 3
Badarpur-Tuglakabad Road.	2 Malis at Rs. 4 each per mensem ...	8	
	1 Bhisti at „ 7 „ for 10 months,	7	
	1 Do. at „ 7 „ for 5 months,	7	
	For the year after deductions of sorts ...	...	218 1 9
Ballabgarh Road.	1 Mali at Rs. 4 per mensem } for 5 months ...	4	
	1 Bhisti at „ 4 „ } ...	4	
	For the period of 5 months after deductions	...	35 13 11
	Total Roadside Establishment ...	...	1,359 4 0
	Groves.		
Kutab Garden.	1 Mali at Rs. 4 per mensem ...	4	
	1 Bhisti at „ 4 „ ...	4	
	For the year ...	...	96 0 0
Tilauri Plantation.	1 Forester at Rs. 25 per mensem ...	25	
	2 Peons at Rs. 5 each „ ...	10	
	For the year after deductions ...	...	421 12 0
Alipur Plantation.	1 Mali at Rs. 5 per mensem ...	5	60 0 0
Tatarpur Plantation.	1 Mali at „ 6 „ ...	6	72 0 0
Rai Do.	1 do. at „ 4 „ for 9 months ...	4	36 0 0
Chaensa Plantation.	1 Bhisti at „ 1 „ for 4 months ...	4	4 0 0
Majhaoli Do.	1 do. at „ 1 „ for 11 do. ...	1	11 0 0
Nangloi School.	1 do. at „ 1 „ for 12 do. ...	1	12 0 0
	Total Groves ...	...	712 0 0
	Total District Establishment ...	...	2,072 0 0
	Arboriculture Establishment attached to Delhi Municipality.		
Delhi Municipal Limits	23 Bhistis with bullocks ...	1,931	
	1 Do. without do. ...	48	
	2 Do. ...	84	
	6 Malis ...	360	
	1 Peon ...	60	
	18 Malis ...	862 13 4	3,345 13 4
	Bela Plantation.		
Bela plantation.	1 Forester at Rs. 25 per mensem ...	25	
	3 Peons at „ 5 each „ ...	15	
	1 Sweeper at „ 4 „ ...	4	
	1 Mali at „ 5 from 1st April to 30th November 1882, ...	5	568 0 0
	Total ...	...	3,913 13 4
	Total Arboricultural Establishment ...	...	5,985 13 4

B.—Delhi Municipal Secretary's Report.

Expenditure.—The following details will show the amount expended towards the maintenance of trees:—

Salaries of establishment	... Rs.	3,345	13	4
Constructing brick enclosures	... ,,	1,226	2	7
Repairs to jafri enclosure	... ,,	152	9	3
Total Rs.	...	4,724	9	2

Comparing the expenditure with that of the previous year, there is an increase of Rs. 833 due to a large number of brick enclosures that were erected in place of jafri enclosures.

The difference observed in regard to the salary of the establishment is slight, and is due to the dismissal of two gardeners whose services were not further needed.

Species of Plants.—The species of trees planted were the same as last year, chiefly Shishum, Peepal, Nim and Siris.

Planting in Civil Lines.—Planting operations in Civil Lines were well attended to. Mostly all the roads are uniformly laid out with trees. A number of young trees were newly planted on both sides of the Boulevard road, leading to the Roshnara garden in the direction of Sabzi Mandi, and with few exceptions they are all thriving. That portion of the Circular Road from the Kashmir to the Mori gate which forms a part of the Civil Station, was replanted in many places owing to failure of the young plants which had been put down the year before.

The Alipur, Rajpur and Underhill roads were also replanted in parts where it was deemed necessary.

Ridge Road.—The Nim trees planted on both sides of the Ridge Road have *flourished considerably.* They have now attained a height of from 10 to 12 feet.

The Park.—This estate alluded to in para. 3 of the year's report is situated in the centre of the Civil Lines. Two years ago it was very unsightly, but since then, a large portion of it has been levelled and planted with trees. The principal row of trees are planted along the wall on the right side of the Alipur and Rajpore roads, being a distance of little over half a mile, and as this row is a double one, it will in a few years, if attended to, form a pretty avenue. The plants are well protected by jafri enclosures.

Planting in City.—Several of the roads in the city were replanted in places where the former trees were either blown down or had decayed. Many of the young trees in the Chandni Chowk and Esplanade had to be replaced. A portion of the Hamilton road between the Mori and Circular road near the Rajputáná Level Crossing was newly planted on both sides. The Lothian, Hamilton and Queen's roads were also supplied with trees from time to time from the public gardens.

Planting in the Suburbs.—Tree planting on the roads outside the city were also properly attended to. Round the Circular Road, from the Kabul to the Delhi gate, 180 trees were planted. The Kutab, Bahadargarh and Gurgaon roads were also replenished with plants as well as the Grand Trunk Road to Karnal, a part of which is within municipal limits. I would here beg to bring to your notice that Badri Das, a resident of the city, with the sanction of the Committee, spent a large sum of money in planting a double row of trees along a kutcha road, upwards of one mile in length, from the Lahore gate to a temple built on the top of the ridge adjacent to the Jhundawala well in the vicinity of the old Reservoir. The trees planted by him have been roughly estimated at about 430, all of which are well protected with enclosures, and an establishment of bhisties and malis is maintained at his own personal expense to attend to the young trees. Another resident, by name Ram Chand, also applied for, and obtained the sanction of the Committee, to plant a double row of trees from the Lothian Bridge to the Bathing ghats on the banks of the Jamna in the direction of the Railway Bridge. About 133 trees were put down and protected by jafries, but some of them have failed.

Bela Plantation.—The income derived from the Bela plantation amounted to Rs. 3,785-8-3, of which the following is a detail :—

Sale of grass and grazing fees &c.	... Rs.	2,040	0	3
,, of decayed trees	... ,,	1,714	8	0
Boat contract	... ,,	31	0	0
Total Rs.	...	3,785	8	3

The expenditure was Rs. 3,310 2 11. This amount was chiefly expended in the clearing of the under-growth which the Medical authorities pronounced as being the cause of sickness in the Fort and in the City.

This matter was reported in full last year, so that there remains nothing else to note save that the plantation is at present in a good sanitary state and free from under-growth, which is kept down by cattle being permitted to graze on the grounds on payment of fees.

2.—GURGAON DISTRICT.

General Remarks.—The rainfall was fair, but the early cessation of the rains caused some injury to the plantations formed during July and August, but owing to the mildness of the winter, less damage was done by frost than in any previous year since 1877.

Kikar was sown in the Nuh Tahsil, but did not germinate. The reason of this is, that Tahsildars carry out orders in a perfunctory manner, and take no real interest in arboriculture. The fine Kikar hedges, raised by the Customs Officers at Nuh, show what care and attention can effect in the most unpromising soil, and the work of Jugalkishor (now Tahsildar of Palwal) on the Nuh-Rewari road has been eminently successful, and is highly creditable to that officer.

I am endeavouring now to raise similar hedges along other roads, where Nim and Shisham have been repeatedly tried in vain. Several plants of *Eucalyptus globula* were obtained from Lahore, and planted, but the soil does not appear suitable, and most of them have died.

The Toon tree requires irrigation, and a good deal of care. Some, which I planted 3 years ago in the Civil lines, are growing into fine trees, but I do not think the Toon is a tree which is likely to thrive in the district generally.

The trees which succeed best, are Kikar and Farash in bad soils, and Nim, Shisham, Gular, Pipal and Bargat in other places. The Kadam, Papri and Kirni grow wild in the Palwal Tahsil, and efforts are being made to extend their cultivation.

A Forester, (Syad Hassan) who has undergone a special training at the expense of the District at the Changa Manga Plantations has been added to the arboricultural establishment, and took up his duties in time to superintend the Plantings made during February and March, but he has not shown much aptitude in his work. He is incorrigibly idle, and nearly all the work done by him has failed.

There is nothing else deserving of special notice.

Description of Work.—The following is a record of work done :—

Tahsil.	Road or Nursery.	Condition at the beginning of the year.	Trees planted.	Successful out of those planted during the year.	Percentage successful.
Gurgaon.	Gurgaon—Sohna Road ...	17,266	2,010	1,170	58 %
	Sohna—Nuh „ ...	..	1,100	740	67 „
	Gurgaon—Railway Station Road ...	6,890	205	155	75 „
	Gurgaon to Bahadargarh „ ...	3,180	400	300	75 „
	„ to Kutab „ ...	1,900	700	350	50 „
	„ to Sohna—Palwal „ ...	4,596	600	400	67 „
	Bahora—Tauru Road ...	1,795	400	370	92 „
	Basai Road ...	203	200	150	75 „
	Farukhnagar Railway Station Road ...	650	655	447	68 „
	Civil Station Roads ...	2,100	510	490	96 „
	„ Nursery (Bir) ...	2,800	...	...	...
	Nursery on Farukhnagar Railway Road ...	...	225	225	100 „
	Bhundsi Nursery ...	...	2,800	planted out on roads.	
	Station Garden Nursery ...	1,000	2,205	Do.	Do.
Nuh.	Nuh—Firozpur Road ...	1,952	135	106	78 „
	Nuh—Palwal „ ...	858	150	100	66 „
	Nuh—Sohna „ ...	...	2,385	1,286	54 „

Tahsil.	Road or Nursery.	Condition at the beginning of the year.	Trees planted.	Successful out of those planted during the year.	Percentage successful.
Nuh.—*contd.*	Nuh—Rewari Road ...	2,000	295	295	100 %
	Taoru—Bahora „ ...	2,566	No new work done.		
	Hattin—Palwal „ ...	347	865	730	84 „
	Silkhoh—Tauru „ ...	70	95	95	100 „
	Tauru Nursery „ ...	15,076	nothing done.		
	Nuh Nursery „ ...	10	284	284	100 „
Palwal.	Palwal to Sohna „ ...	2,740	512	306	60 „
	Palwal to Nuh „ ...	264	25	25	100 „
	Do. to Hattin „ ...	486	361	295	81 „
	Palwal Nursery „ ...	1,044	1,357	planted out on roads.	
	Nursery at 5th mile—Palwal—Sohna Road ...	500	400	400	100 „
	Do. at 2nd. „ Do. ...	200	200	200	100 „
	Nursery on road from Palwal to Hattin ...	...	250	250	100 „
	Do. Palwal to Nuh ...	...	100	90	90 „
Firozpur.	Firozpur to Nuh Road ...	1,899	353	265	75 „
	Do. to Alwar „ ...	804	300	250	83 „
	Do. Jhirka Pass „ ...	347	220	120	60 „
	Rewari to Jhajjar „ ...	...	1,434	790	53 „
	Circular Road ...	1,333	239	220	92 „
	Railway Station Road ...	762	100	80	80 „
	Nursery on Rewari-Jhajjar Road ...	...	400	350	87 „

Gurgaon and Nuh Tahsils continue to show the best results. There are good avenues on the roads leading from Gurgaon to the Railway Station to Bahadargarh the Kutub, &c. Rewari has done much better in tree-planting this year, but the work is confined almost entirely to the Municipal Tahsildar.

Tahsildar Asghar Ali during the 5 years of his incumbency, has done absolutely nothing in the way of arboriculture.

Two new nurseries have been formed, and largely planted at Palwal :—
Katcha wells were sunk or deepened on the—

Kutab Road	4 wells cleaned.
Bahadargarh „	1 well made, 2 wells cleaned.
Railway Station „	2 wells cleaned.
Bir Nursery	1 well cleaned.
Gurgaon—Sohna Road	6 new wells, and 2 cleaned.
Sohna—Palwal „	3 new wells, and 2 cleaned.

and at Bhundsi nursery (well previously made—paid during present year.)

"Tháolas" were erected for protection of young trees, and during winter they were protected from frost, by the ordinary method of enclosing them with straw.

Establishments and Supervision.—The following Establishment has been kept up :—

Gurgaon Tahsil—	*Malis.*	*Bhistis.*
Gurgaon-Sohna Road...	3 @ 4 Rs.	5 @ 4 Rs.
Sohna-Nuh „	1 „ 4 „	3 „ 4 „
	For March only.	
Gurgaon Railway Station Road	2 „ 4 „	2 „ 5 „
Bahadargarh Road	1 „ 4 „	2 „ 5 „
Kutab „	2 „ 4 „	2 „ 5 „
Sohna-Palwal „	2 „ 4 „	3 „ 4 „
Bahora-Tauru „	1 „ 4 „	1 „ 4 „
Basai Road		1 „ 5 „
Farrukhnagar Railway Station Road ...	1 „ 4 „	2 „ 5 „
Civil Station	2 „ 4 „	2 „ 5 „
Bhundsi Nursery	1 „ 5 „	
And 1 Darogha	1 „ 12 „	

		Malis.	Bhistis.	
Nuh Tahsil.				
Nuh-Firozpur Road	@		1 @ 6 Rs.	
Nuh-Sohna „	3	„ 4	(*temporary*).	
Nuh-Rewari „		„	„ 1 „ 6	
Hattin-Palwal „	1	„ 4	„ 1 „ 6 „	
Tauru to Bahora „	1	„ 4	„ 3 „ 6 „	
Silkhoh-Tauru „	1	„ 4	„ 1 „ 6 „	(*tempy.*)
Tauru Nursery	1	„ 4	„	
Nuh Nursery	1	„ 4	„	
Palwal Tahsil.				
Palwal-Sohna „	2	„ 4	„ 1 „ 4 Rs.	
„ Nuh „	1	„ 4	„	
„ Hattin „	1	„ 4	„ 1 „ 4 „	
Palwal Nursery	1	„ 2-8,	moiety 4 „	*Hire of water.*
Firozpur Tahsil.				
Firozpur Nuh & Alwar Road	1	„ 4	„ 1 „ 7 „	
Firozpur Nursery	1	„ 4		
Bhadas Nursery	1	„ 5	„ *nothing done.*	
Rewari Tahsil.				
Rewari Jhajjar Road	2	„ 4	„ 2 „ 7 „	
Circular Road } Railway Station Road }	4	„ 4	„ 4 „ 7 „	

This establishment *is not regularly kept up.* In May & June, additional Bhistis are entertained, until the rains set in.

Supervision is effected by tahsildars and zaildars and two tree daroghás, one of whom (who is paid from Provincial and District Funds) has the roads about the Sadr Station made over to him, and the other moves about the district.

Financial Results.—The receipts and charges of the year are given below, and as might be expected, there is a large deficit, though the receipts have increased.

	Rs.	A.	P.
Receipts			
From sale of trees	464	6	0
„ „ grass	255	14	6
	720	4	6
Charges.			
Pay of Malis	1,533	11	6
„ of Bhistis	1,739	3	4
„ of 2 Daroghas	189	11	3
Cost of Scholar at Changa Manga ...	48	12	0
Protection of trees	78	7	0
Planting trees	204	14	6
Kikar & Nim Sowings	28	9	6
Making & cleaning Kacha wells ...	36	9	0
Making Tháolás	96	10	0
Implements got from Calcutta ...	16	10	0
	4,073	2	7
Deficit, ...	3,352	14	1

3.—KARNAL DISTRICT.

General Remarks.—Nil

Description of Work. A.—Trees planted within the last three or four years are still receiving maintenance.

B.—Planted this year.

Establishment and Supervision.—The annexed statement shows at a glance the information required under the above mentioned headings.

It will be seen that 7,200 young trees of previous years received maintenance during the year along the sides of roads. To these were added 4,400 which were planted during the year, making a total of 11,600 young trees receiving maintenance. These numbers represent trees which are thriving well, for the places of those which died were filled up by others. Nearly all this work was near the Head-Quarters of the three tahsils, and therefore received plenty of surpervision from the Tahsildars, and their subordinates. Particularly those in the Civil Station of Karnal and on the Circular road round the town which the Deputy Commissioner could constantly look at himself. It will be seen from the statement which forms

part I. of this report, that the ten miles of road from Panipat to Sanali have been completely planted with an avenue. In a few years the 1,750 young trees now being nurtured along its sides will have grown up. The 6 miles 2 furlongs of Station roads at Karnal are the important roads of the station, the one mile three furlongs still remaining without trees being unfrequented roads. It is hoped, therefore, that in a few years the appearance of the Civil lines of Karnal will be greatly improved. The spring level is near the surface, and the average rainfall 28 inches, so that now that the young trees have made a good start they should grow rapidly. The soil too is favorable to the growth of trees. In the Nursery in the Station garden at Karnal about 3,000 seedlings sown during the year have come up, a similar number were transplanted during the year, and a similar number still remain which are fit for transplanting now. Similar numbers and similar remarks apply to the Nursery at Panipat. The Nursery at Kathal is on a smaller scale, being in the garden of a private person. Rs. 1,300-0-0 was spent on the construction and repairs of mud-fences. A superior sort of mud-fence or walled enclosure with an encircling ditch was started as an experiment and found to be successful.

Transplanting was done to a large extent as will be seen by the charge of Rs. 400-0-0 entered in the Financial Statement at the end of the report.

The Financial result is a deficit of Rs. 5,147-6-6 *vide* the statement. The expenditure on establishment alone was Rs. 3,335-0-0.

Statement of figures referred to in Headings Description of work and Establishment and Supervision.

1	2	3			4		5		6		7	8		
		No. of trees.			Mates.		Malis		Bhisits					
No.	Name of Road.	Receiving maintenance.	Planted during the year.	Total.	@ 5 Rs.	@ 7 ,,	@ 5 ,,	@ 7 ,,	@ 4 ,,	@ 5 ,,	Pakhalis @ 8 Rs.	Total annual cost.		
	Tahsil Karnal.													
1	Karnal and Kaithal Road ...	1,007	349	1,356	...	...	1	...	3	...	4	445	11	11
2	,, and Jagadhri Road ...	284	...	284	...	...	...	...	1	...	...	8	0	0
3	,, and Hansi Road ...	56	227	283	...	...	..	...	2	...	...	55	9	9
4	,, and Mirat Road ...	172	...	172	1	...	...	...	1	...	...	4	0	0
5	,, and Firozpur Road ...	673	203	876	...	...	1	...	4	...	...	192	13	6
6	Civil Station Karnal ...	862	1,235	2,097	...	...	2	...	8	...	...	321	1	7
7	Road round the city ...	...	818	818	...	...	...	..	4	...	...	79	7	4
	Total ...	3,054	2,832	5,886	1	...	4	...	23	...	4	1,106	12	1
	Tahsil Kaithal.													
8	Kaithal and Karnal Road ...	305	...	305	1	...	...	...	3	...	..	202	0	3
9	,, and Deobund Road ...	910	...	910	..	1	...	...	7	...	...	409	12	0
10	Rajaund and Asandh Road ...	401	...	401	...	...	...	...	4	...	...	192	0	0
11	Pundri rest house compd. ...	...	100	100	...	...	...	...	1	...	...	48	0	0
	Total ...	1,616	100	1,716	1	1	...	...	15	...	...	851	12	3
	Tahsil Panipat.													
12	Panipat and Sanauli Road ...	1,373	377	1,750	...	1	...	...	6	2	1	508	15	3
13	Panipat-Kothie to Karnal ...	660	..	660	1	...	...	..	3	2	...	278	4	10
14	Grand Trunk Road to Kothie Panipat.	508	35	543	1	...	...	...	...	1	...	103	6	3
15	Chhajpur and Sewa Road ...	...	1,050	1,050	...	...	...	...	...	...	...	...	...	...
	Total ...	2,541	1,462	4,003	2	1	...	...	9	5	1	890	10	4
16	Nursery at Karnal ..	...	...	...	...	...	3	1	...	...	...	264	0	0
17	,, at Kaithal ...	...	...	...	...	..	1	..	...	...	...	60	0	0
18	,, at Panipat ...	...	...	...	...	...	3	...	...	...	...	180	0	0
	Total	...	...	...	...	...	7	1	...	...	...	504	0	0
	GRAND TOTAL ...	7,211	4,694	11,605	4	2	11	1	37	5	5	3,353	2	8

The following Statement will show the Income and Expenditure on the Arboriculture operations during the year under report.

Receipts.	Amount.				Charges.		Amount.		
				5	Pakhalis @ Rs. 8	...	370	4	4
Sale proceeds of dead trees of road sides ...	274	15	0	47	Bhistis „ „ 4 each	...	1,709	2	7
				5	„ „ „ 5 „	...	227	10	10
				4	Malis „ „ 5 „	...	205	2	8
Sale proceeds of trees of Station Garden, Karnal ...	39	0	0	6	Mates @ various rates	...	336	14	3
					Cost of transplanting 5546 trees	...	407	8	5
					Construction of 3421 Mud-fences	...	984	14	6
					Repairs to 3314 Mud-fences	...	171	1	5
					Miscellaneous	...	137	4	3
					NURSERIES.				
				1	Mali @ Rs. 7 per mensem	...	84	0	0
				7	„ „ „ 5 each	...	420	0	0
					Miscellaneous	...	167	6	3
					Subscription to A. H. Society	...	240	0	0
					TOTAL Rs.	...	5,461	5	6
Total Receipts ...	313	15	0		Deficit Rs.	...	5,147	6	6

HISSAR DIVISION.

Remarks by Commissioner.—Colonel Harcourt at Rohtak, and Major Parker at Hissar did their best to try and improve the arboriculture of their Districts by insisting on the Tahsildars maintaining nurseries at the Tahsil Head Quarters, and personally inspecting them.

Tree-planting in these dry tracts is attended with the greatest difficulties. In a great part of the Rohtak District, the moisture is close to the surface, and unless proper arrangements are made for digging through the Kankar beds, the trees always remain stunted and miserable.

The storms which visit these districts do great damage to the trees. During the last week, more than a dozen fine trees were destroyed in the station of Rohtak. The trees were in each instance twisted round by the violence of the wind, and broke off about twelve feet from the ground leaving a naked stump.

About a month ago on my road to Rohtak, after one of these storms, I noticed more than fifty trees thus treated, besides many others which had large branches forcibly torn off.

Considering all these difficulties to which arboriculture is exposed in these regions, the success which has attended the efforts of the various officers who have had charge of the districts is satisfactory.

4.—HISSAR DISTRICT.

Deputy Commissioner's Report.

General Remarks.—During the year 1881 the seasons were generally favourable for arboriculture, and the rainfall was a fair average quantity for this district.

The difficulty of planting roadside avenues in the dry parts of the district is considerable, and in many parts it appears practically unsurmountable with the exception of a few miles of roads in the Hansi Tahsil and in Hissar station the water of the Western Jamna Canal does not touch the great main lines of road in the district; and cannot be utilized for the formation of roadside avenues. The severe heat of the dry season causes the destruction of a large number of young trees. It is also most difficult to provide for proper supervision of long avenues in a district like this.

I think, however that some improvement might be effected by working more according to fixed system as has been pointed out in the Provincial Review for 1880-81. It was impossible to effect much improvement during the past cool season, but I hope that the initiation of a more systematic method of procedure in the current year may be productive of improved results. The chief success in the year under report was obtained in the Hansi Tahsil, and it is no doubt that locality which offers the best hope of future improvement.

The trees planted in the roadside avenues were nearly entirely Shisham, and Kikar. The superior species of trees will not flourish in the dry tracts.

The avenues were lopped in November with sufficient care.

Description of Work—Avenues.—The Hissar Tahsil is placed first in the statement, work has been confined to filling up gaps in existing avenues. It may be noted that the main road from Hissar to Hansi (*via* Mahiyar) has passed under charge of the Public Works Department who will in future be responsible for maintenance of roadside trees.

In the Hansi Tahsil 15½ miles of road were planted. The road from Hansi to Mahim is a section of the main Dehli-Hisar road which as above noted has now been handed over to Public Works Department. Special attention will be devoted to the Hansi-Bhiwani road with the object of forming a continuous avenue if possible between these two towns.

In the other three Tahsils, Bhiwani, Fatehabad and Barwala, little has been effected. Bhiwani is peculiarly unfavourably situated with regard to soil and climate. It is as much as the Tahsildar can do, to keep alive the trees at present existing. The formation of a real nursery for trees appears impossible; that existing at the encamping ground is only one in name, and such trees as are planted out have to be brought from Hansi. In Fatehabad and Barwala gaps were filled but no additions were made to the total length of existing avenues.

Groves, Nurseries and Plantations.—The "Park" at Hissar which is in fact a Sadar Nursery for trees has been much improved during the year. A considerable number of young trees were planted. The ground is at present watered by Jhalars or shallow wells fed by canal water; but it is hoped that by an alteration of the water courses it may be possible to obtain a flow of canal water over the lower parts of the ground, and if this could be effected the plantations would no doubt improve greatly.

A nursery was formed near the Dak Bungalow in a position favorable for irrigation from the canal.

The site of the cattle fair was planted by Major Parker with trees in groves, most of which have lived.

The nursery at Hansi has received due care and attention. That at Bhiwani as above remarked is one only in name.

As regards number of trees planted during past years, and the year under report, the following figures are furnished :—

	Roads.	Encamping grounds & Nurseries.	Gardens.
Number of trees planted in previous years	15,390	3,097	2,443
„ planted during 1881-82	8,400	6,500	2,400
TOTAL ...	23,790	9,597	4,843
No. of trees that failed of those planted during the year ...	4,390	2,181	1,043
Number of trees now standing	19,400	7,416	3,800
Percentage of successful trees	81·25	78·31	76·39

These figures perhaps give a too favourable picture of the results of arboricultural operations during the year under report. But a great deal was done last rainy season by Major Parker in the way of the planting: and the proportion of trees which have survived has been fairly good.

Establishment and Supervision.—The establishment was increased by Major Parker by the addition of 5 malis and 2 Pakhalis or Water Bearers. This addition was rendered necessary by the enclosure and improvement of the Park at Hissar. The total expenditure on establishment is now 2,900 against 2,580 the year previous. No special supervising agency except one jamadar is provided. Tahsildars supervise arboriculture each in their own Tahsil.

Financial Results.—Notwithstanding the increase in expenditure on establishment, the financial results are slightly better than last year, they are as follows:—

Receipts.	Rs.
By sale of grass, &c·	114
„ „ fallen trees	173
TOTAL ...	287

Charges.	Rs.
Establishment	2,900
Irrigation dues	200
Feed and keep of 5 pairs of bullocks	772
Purchase of seed and planting operations	265
Fencing	200
Miscellaneous expenses	325
Total	4,662
Deficit	4,375

5—ROHTAK DISTRICT.

General Remarks.—During the year under report there have been no abnormal features which can be said to have affected arboriculture, which has, on the whole, progressed satisfactorily. Tree-planting has been carefully seen to, and detailed instructions have been given to the tahsildars, which, if properly attended to, might I think have resulted in even a better out-turn than there has been. But tahsildars cannot be everywhere, and subordinates, whenever they get a chance, seem to think it one of their chief duties to cut and hack at every tree which promises to show a little exuberant life, and to such an extent has this vicious system of lopping and pruning been carried on, that I have now issued positive orders that only one man in each tahsil is to be empowered to prune, and this man is to be specially selected by the tahsildars. It seems to me wonderful how trees ever do arrive at maturity with all the disadvantages they have to struggle against. At first all seems to go well, but after a little, some officious mali proceeds to disfigure the saplings with his blunt knife, the protectors no longer answer the purpose for which they were constructed, and goats and cattle make their daily meal off the tender shoots. Then an effort is made to check this, and more thorns are piled on and are pressed down on the top of the struggling trees which if it ever survives this ill treatment, of course grows all on one side with a gnarled and twisted stem. There is only about one Tahsildar in every ten who really cares much for or who has in the least studied arboriculture, and one has to be perpetually on the look out to check blunders and correct mistakes. The planting out of roadside avenues as detailed in last year's report has been continued with success, and if the young trees are but properly seen to and conserved, the gain to the district will be enormous.—

The trees that grow best in this district are the Shisham, which, however, requires plenty of water, the Farrash, a slow grower at first, but hardy and very umbrageous as it increases in size, the Nim and, a tree termed the Belati Bequin (the technical name of which I am unacquainted with). This last tree grows very rapidly, and is I think the handsomest tree pictorially speaking that the plains can boast of.

Description of Work.—Nurseries have been established at Jhajjar and Gohaná, but the one at Gohaná has not been seen to properly. In Rohtak there is a very large nursery well stocked with Mulberry, Shisham, and Pipal, and I have lately enclosed a piece of ground near a tank just outside the Tahsil, where Shisham seed has been sown broadcast, and where an effort has been made to rear saplings on a principle advocated by Mr. Down, of the Forest Department, the roots of the tree being cut into 4 inch pieces and inserted horizontally into beds of earth. Though the shoots have been slow in cropping up, the experiment has I am glad to report, turned out a success. From the Rohtak nurseries young healthy trees were supplied in great number for the Rohtak and Jhajjar, and Rohtak and Bhiwani roads, and from this nursery were issued the trees which this year I have had planted all round the town of Rohtak on either side of the roadway. These trees are all in a very thriving condition.

The number of trees planted out with the number that have died during the year under report are as below;

	Planted	*Died*
Rohtak	1,456	664
Sampla	536	36
Gohaná	1,217	460
Jhajjar	1,918	942

I am in a position to say that these returns are fairly reliable, for I have seen nearly all the roads in the District, and have inspected almost all the trees which have been planted out—many of which have been actually inserted in the soil under my own supervision. All the tahsildars have exerted themselves and deserve credit for what they have done. In my last year's report I gave a list of the chief roads on which trees were a desideratum and showed what was being done. On each of these roads the work so commenced has been continued and arboricultural operations are gradually being extended.

Establishments and Supervision.—The Establishment remains at much the same strength as it was last year, and the men in the gardens are instructed both by me and the tahsildars as to how they should look after, and protect the young trees. As an experiment at each tahsil 100 ghurras were placed at selected trees, the water from the ghurra percolating to the roots of the sapling. Where the ghurras can be seen to by the Tahsildars or really well qualified persons this system of watering answers well, but the holes in the gharras are very liable to get choked up, and then they are no use at all. With efficient protection and a proper supply of water, trees of all sorts would grow in this district as well as they would any where. The direct management and supervision of arboricultural operations I have during the year kept in my own hands.

Financial Results.—No financial results can be as yet forthcoming. The only income there is accrues from sale of trees which have been blown down and this forms a very small item.

Statement showing Arboricultural receipts and charges for 1881-82.

Name of Tahsil.	Income.	Expenditure.			Total	Surplus.	Deficit.	Remarks.
	Sale of trees.	Pay of Establishment.	Water rent.	Miscellaneous.				
Rohtak ...	27	1,284	20	...	1,304			
Jhajjar ...	31	941	...	192	1,133			
Sampla ...	10	966	...	...	966			
Gohana ...	125	915	...	99	1,014			
Total ...	193	4,106	20	291	4,417	...	4,224	

Statment showing the strength of the Arboricultural Establishment employed during the year 1881-82.

Name of Tahsil.	Strength of Establishment.						Remarks.
	Jamadar.		Mali.		Bhisti.		
	No.	Salary.	No.	Salary.	No.	Salary.	
		Rs.		Rs.		Rs.	
Rohtak ...	1	20	9	5	7	6	
Jhajjar ...	1	6	6	5	9	6	
Sampla ...	1	6	7	5	9	6	
Gohana ...	1	7	8	5	7	6	
Total ...	4	...	30	...	32	...	

6.—SIRSA DISTRICT.

General Remarks—The rainfall during this year in all the Tahsils was much greater than the average fall of five previous years, though it favored the growth of trees, damage was done to most of the saplings by white ants.

Description of Work.—The gaps left by the drying up of trees on roadsides were chiefly filled up this year by transplanting trees from the nurseries. The trees thus transplanted were 2 or 3 years old. Encouraged by the plentiful rainfall seeds were in some instances sown in roadside gaps; they germinated and came up to a certain height, but most of them were subsequently destroyed by white ants. The old trees on the roads were also looked after.

No experimental sowing of seeds of *Eucalyptus* or of any other trees was made this year.

There are two nurseries for rearing trees in this District. One at Dhanur on the Ghaggar, supplies trees required for roads in Tahsils Sirsa and Dabwali. The other at Fazilka furnishes trees for Tahsil Fazilka roads. The third nursery at Sirsa reported in 1880-81 has been abandoned since January 1882 as its maintenance so near Dhanur (7 miles) was not considered necessary.

In these nurseries there are a few old fruit bearing trees, which yield a small income. The seedlings at the close of the year at Dhanur were 5,598, and at Fazilka 6,000. The species of trees generally sown in them are Nim, Siris, Shisham, Pipal, Guava, Pomegranate.

Trees were also planted on scattered plots during the year, and existing trees were maintained.

The young trees on roadsides were generally protected by thorn-fencings, and in winter they were preserved from frost by grass coverings.

Kikar and Beri are indigenous to the soil of this district. In Tahsil Fazilka, on the river side especially, Siris and Shisham grow very luxuriantly.

Establishment and Supervision.—The establishments for nurseries and for the maintenance of roadside trees are detailed as follows :—

NURSERY ESTABLISHMENT.

1.—Mali @ Rs. 6 per mensem	Rs.	72	0	0		
1.—Coolie @ „ 5 „	„	60	0	0		
1.—Chowkidar for 5 months in the summer, from 1st March to 31st July 1881 @ Rs. 5 per mensem.	„	25	0	0	=157	0 0

ROADSIDE TREES—ESTABLISHMENTS.

1.—Bhisti @ Rs. 6 per mensem... ...	Rs.	72	0	0		
1.—Cooli @ 5 „	„	60	0	0		
1.—Bhisti for 6 months 29 days @ 1 ...	„	6	14	9		
4.— do. „ 10 „ @ 2 ...	„	80	0	0		
2.— do. „ 9 „ 16 days @ 2 ...	„	37	7	7		
1.— do. „ 2 „ 15 „ @ 4 ...	„	9	14	11	=266	5 5

The establishments set forth in the preceding para. are under the immediate control of the Tahsildars.

FINANCIAL RESULTS.

The financial results of this year's operations show a deficit of Rs. 519-6-11 as will be observed from he Income and Expenditure stated here. The District Fund from which charges were incurred was credited with the income.

Income.

(1).—Sale proceeds of dry and fallen trees ...	Rs.	37	9	0
(2).—Sale of fruits, &c, of the nursery trees at Fazilka.	„	5	4	0
(3).— Do. do. at Dhanur ...	„	9	8	9
Total	„	52	5	9

Expenditure.

(1).—Pay of nursery establishment ...	„	157	0	0
(2).—Rent for water supply given in Dhanur nursery.	„	60	0	0
(3).—Feed of nursery garden well bullocks ...	„	43	7	0
(4).—Other contingencies connected with nurseries	„	32	12	9
(5).—Pay of establishment for maintaining road-side trees ...	„	266	5	5
(6).—Contingencies connected with the above ...	„	12	3	6
Total	„	571	12	8
DEFICIT		519	6	11

7.—UMBALLA DISTRICT.

General Remarks.—There have been no events peculiar to the year under review affecting arboriculture in this district.

Description of Work.—On four miles of Umballa and Pihewa road 1,600 trees were planted, of which 300 failed. Successful plantation percentage is 81·25.

2,023 trees were planted to fill up gaps on roads. The total failure of trees was 339. The percentage of successful planting is 83·24.

There are three nurseries along the Umballa and Pihewa road, and a fourth just outside the Umballa Tahsil.

There are no groves in this District.

Establishment and Supervision.—31 Malis and 18 Bhistis were employed during the year.

The work is supervised by the Tahsildar, naib Tahsildar, Tahsil Jamadars, District Overseers and Mistries.

Financial Results.—The following is a detail of the income and charges of arboriculture operations in this District for 1881-82.

		Rs.	A.	P.
Receipts.—Sale proceeds of withered and fallen trees including pruned branches.	...	1,160	4	6
Sale proceeds of fruit	...	174	9	0
Sale proceeds of lac	...	135	4	0
Total Income	...	1,470	1	6
Charges.—Pay of 18 malis at Rs. 5 each per mensem	...	1,080	0	0
„ 13 „ at „ 4 „	...	624	0	0
Pay of 20 Bhistis at Rs. 5 each per mensem for 8 months	...	720	0	0
Cost of maintenance of 4 nurseries	...	100	0	0
„ fencing and tools and plants	...	66	9	2
Total Charges	...	2,590	9	2
Deficit Balance	...	1,120	7	8

8.—LUDHIANA DISTRICT.

General Remarks.—The average fall of rain in the District is about 28 inches yearly, except in very exceptional years, such as in 1880-81 when it rose to 41·4. The falls were well timed and equally distributed.

Description of Work.—On the 26 miles of Kalka road 1,725 trees were planted in lieu of those decayed and otherwise destroyed.

On the 4½ miles of Kotla road 1,605 new trees were planted in lieu of those destroyed or decayed. Owing to the whole length of road being sandy it is very difficult to get any kind of trees to thrive, hence the large number of trees that are planted yearly.

There were 800 new trees planted on the Jamalpur road in room of those that died or were destroyed by white ants, cattle, &c.

On the Sidwah road 1,256 new trees were planted to replace those decayed or destroyed.

A few trees were only planted on the Samralla road as those of previous years are thriving well, so also on the Khunna road.

A height of 10 feet to admit of a horseman passing from the ground is observed when the lopping commences in December, care is taken to saw branches to prevent fractures and damage to the trees in lieu of chopping with axes.

There are three nurseries in this District from which young trees are transplanted during July and February one at the Ludhiana, another at Busseeah, and a third on the Machiwara road a mile from the Town which are ample for this District.

There are no other plantations on Government lands in this District.

Establishment and Supervision.—Consists of 70 planters and baildars at Rs. 4 each per mensem, and 10 mates at 5, 6, and 7 each per mensem, the mates are placed over gangs, and sub-overseers supervise in each Tahsil, Head overseers at the Sadr being over all.

The cost of maintenance during the year under report was	...	4,140	0	0
Transplanting	...	3,844	0	0
Maintenance	...	296	0	0

Financial Establishment.—The income of the year under review from sale of trees hewn down or destroyed by dust storms and lopping &c., was Rupees 2,150, against 2,296 of last year.

9.—SIMLA DISTRICT—*Nil.*

JULLUNDUR DIVISION.

Remarks by Commissioner.—

No events specially affecting arboriculture occurred during the year. The rainfall was generally favorable for arboricultûral operations, and judging from the results the subject would appear to be receiving increased attention in all three districts; especially in the Jullundur and Kangra Districts where it has hitherto been somewhat neglected.

The actual work done in the Jullundur District consisted chiefly in filling up gaps and blanks in existing avenues. At the same time, 18½ miles of new avenues were planted, as compared with only 4 miles in the year before, *viz* :—

On the road from	Phillour to Bhandri ferry	... ...	12 Miles.
Do.	Hamirpur to Nurmahal	... ...	5 „
Do.	Phillour to Samrai	... ..	1 „
Do.	Jullundur to Tandah	... ...	½ „

The total number of trees planted was 4,766, of which a considerable percentage is reported to have succeeded. The trees were chiefly shisham. Besides this, 11 miles of avenues were thinned out and trimmed in accordance with the special instructions issued by me on the subject in 1879, and referred to in my report of last year. In the number of plantations there was a diminution, three having been washed away by the Sutlej. The number of these left is 46. On the other hand, 8 new nurseries were established during the year at suitable spots, each of 2 bigahs of land, and it is hoped that these will prove efficient sources of supply. The need of more nurseries was pointed out to the Deputy Commissioner in a circular issued from this office last year.

In the Hoshiarpur District too the work of the year, so far as avenues were concerned, consisted chiefly in filling up gaps, for of new avenues only 7½ miles would appear to have been planted, and altogether 8,795 trees were planted, of which 68 per cent. succeeded. Besides this, 76 acres, 3 roods, 14 poles of the area of the encamping grounds in the District were planted out with 4,937 trees, of which 55 per cent. succeeded, 3,608 trees, of which 85 per cent. succeeded, were also put down in the various public gardens. Also over 50 acres of land in the "Chôs" were again planted out with Munj grass and "Nara," the work done in the previous year having been damaged by the rains. A good deal was also successfully done in the way of putting down Munj grass, "Nara," and "Kahi" on the road-side, in the extension of the *Aloe* and in the cultivation of the *Euclyptus.*

The subject of trimming and pruning also received due attention.

In this District, out of 438 miles and 3 furlongs of road, 263 miles and 4 furlongs have now been planted. Altogether, the operations in this District may be said to have been carried out with care, and with a large degree of success; the credit of which is chiefly due to the late Deputy Commissioner Mr. Coldstream, and his assistant Mr. Faddy.

In the Kangra District 52 miles of avenues were planted, thus—28 miles on various roads in the Hamirpur Tahsil, 21 miles on the Kulu and Lahoul road; and 1½ miles each on the Dantal and Kathgarh and the Dear and Joala roads.

The total number of miles of avenues now existing in this District is 341. The number of trees reported to have been planted during the year is 30,386, of which only 14 per cent. are reported to have died. They were chiefly Tun, Shisham, Mango, Mulberry and Jamun. The establishment of nurseries in this District is now, it is satisfactory to note, engaging serious attention. The services of a number of the leading Zamindars have been enlisted in the cause, and each of these has it is reported undertaken to establish a small nursery within his circle. These will form useful adjuncts to the large District nurseries. Mr. Gladstone, the late Judicial Assistant Commissioner, took much interest in arboriculture, and much of the progress made is due to the impulse given by him to the cause. Still greater progress may be looked for in the future, now that a substantial foundation has been laid, and interest in the subject generally aroused.

The establishment in the Jullundur and Hoshiarpur Districts consisted, in the former of 1 darogah, 6 peons, 1 gardener and 4 coolies; and in the latter of 4 jamadars and 92 malis and coolies who were supervised by 4 sub-overseers. In the Jullundur District, however, an additional establishment of 10 coolies has since the beginning of the year been kept for the new nurseries established, and in the hot weather extra bhistis were entertained, still the difference is very large in the strength of the establishment of the two Districts; this is due to the fact, that while in the former the Deputy Commissioner has for many years taken a keen interest in arboriculture, in the latter, the subject had been much neg-

lected, and has only recently been again taken up in consequence of repeated injunctions issued from this office. The Deputy Commissioner of Kangra has given no details, but merely says that the cost of the establishment has been the same as in the previous year, *viz*, Rs. 180 per annum.

The receipts in the several Districts were :—

Jullundur	Rs.	4,084
Hoshiarpur	„	6,461
Kangra	„	250

and the expenditure :—

In Jullundur	„	1,624
„ Hoshiarpur	„	6,228
„ Kangra	„	650

There was thus a deficit only in Kangra to the extent of Rs. 400; while the surplus in Jullundur amounted to Rs. 2,460 and in Hoshiarpur to Rs. 213. The falling off in receipts in the latter is accounted for by the fact that unusually large sums were realized in the previous year from clearings at certain encamping grounds, as explained in last year's report. The income from this source in this District is still the largest in this Division, and although the expenditure is also the largest, the money is well laid out.

In conclusion, I would add that although I concur with Mr. Bullock in thinking that a far greater measure of success at a *smaller cost* would be obtained if the services of the agricultural population were enlisted in carrying out our arboricultural operations, yet I do not go with him to the extent of thinking that success can *only be looked for by handing over the whole matter to the Zamindars.* The success obtained in the Hoshiarpur District, although at a large out-lay is evident to the contrary, and the circumstances of this District are not so different from those of the Jullundur District as to materially affect the conclusion to be drawn from the results obtained in the former District.

10.—JULLUNDUR DISTRICT.

General Remarks.—No event specially affecting arboriculture occurred last year.

The gardener who was sent to the Government Plantation at Changa Manga, about whom mention was made in the report for 1880-81, returned in February last after a year's training at the plantation.

His services will be employed in supervising the trimming of trees and giving instruction to the arboriculture Establishment.

Description of Work.—Road from Jullundur to Tandah.

This road is 19 miles long, of which 7 miles were planted in previous years and ½ mile in the year under report, the remaining 11½ miles were planted in former years but the trees failed, 340 trees were planted last year on this road, of which 85 per cent. were successful. The trees are in pretty good condition.

In Tahsil Phillour seeds were sown on roads from Phillour to Nurmahal and from Phillour to Bhundri Ferry, and this has been shown as a new work. The seeds have failed.

ROAD FROM PHILLOUR TO SAMRAI.

The length of this road is 15 miles, 3 miles were planted in previous years and one mile during the year. 300 shisham and siris trees were planted and are now flourishing.

The work of the year on other roads was confined to filling gaps and blanks.

The total number of trees planted during the year on road sides was 4,766.

The following roadside avenues were trimmed during 1881-82, in accordance with the instructions issued by the Commissioner in 1879.

Nawashahr to Rahon	4 miles
Nawashahr to Mubarakpur	3 miles
Bangah to Nawashahr	4 miles

Plantations.—There are 23 Government plantations or 3 less than last year, on the banks of the Sutlej, 8 in Phillour, 14 in Nakodar and 1 in Nawashahr Tahsil. Two in Phillour and one in Nakodar have been washed away by the river.

Nurseries.—The Jullunder nursery garden supplied 3,755 trees during the year, of which 2,356 were planted on District roads and 1,399 given to Zamindars free of cost.

Eight Nurseries were established this year at various suitable spots for the propogation of trees to be utilized on the roadsides. Two bigahs of land have been appropriated for each nursery, being purchased where necessary, and proper arrangements have been made for watering and for the care of the nurseries by a paid establishment. These plots have been sown with seed and should prove efficient supply grounds, and as funds become available their number will be increased.

Establishment.—The District arboriculture establishment has been as follows:—

1 Darogha	@ Rs. 15 per mensem	} To watch plantation on the river side.	
6 Peons	@ „ 4 each		
1 Gardener	@ „ 10	} Jullundur Nursery.	
4 Coolies	@ „ 4 „		

From the commencement of the current year an establishment of 10 cóolies at Rs. 4-8-0 each has been kept up for the new nurseries established in the District.

No special establishment was entertained for the purposes of planting trees on road sides. Naukar coolies employed on road repairs did the work of planting trees as well as of looking after avenues, but in the hot weather extra bhisties were entertained in the Nawashahr and Jullundur Tahsils.

Financial results.

		Rs.
Receipts.—Sale of wood and grass on road sides	...	3,446
Do. Do. of plantations	...	347
Sale of fruit and vegetables of Jullundur Nursery garden	...	291
Total Rupees	...	4,084

			Rs.
Charges.—Pay of arboriculture establishment	...	...	914
Arboriculture Contingencies	...	...	182
Maintenance of roadside trees	...	...	528
Total Rupees			1,624
Surplus Rupees			2,460

In conclusion I would venture to express an opinion that roadside planting will never be attended with a proper amount of success, except by making the matter over to the Zamindars upon terms to be fixed and recorded at settlement. The conditions of the Hoshiarpur District are very favourable for arboriculture, but the contrary holds as to other Districts with their arid plains and sandy soils.

Any one who has devoted any time to gardening will know the amount of care and watering necessary to raise trees, and will appreciate the small degree of success likely to be obtained over miles of road with insufficient water, an establishment far removed from the constant supervision of the master, and numerous enemies in the shape of goats and cattle.

The Zamindars might be compelled to provide for the watering and a reduction be made for that object in the village Jamma, and the amount of this reduction might be repaid to Government by the District Fund.

II.—HOSHIARPUR DISTRICT.

General Remarks.—The season of 1881-82 was favorable in the extreme for arboricultural operations. The rainfall throughout the year ending considerably above the average.

In addition to the large nurseries existing in each Parao or encamping ground, the attention of the overseers and jamadars was drawn to the importance of having minor nurseries at closer intervals. Each mali was directed to have one or two nurseries in his own beat or length of road, with a view to obviate the necessity of his going six or seven miles to the nearest encamping ground for his saplings. The scheme has been carried out with the most satisfactory results.

A good deal has been done all over the district in planting out *Nara* "Malva Parviflora"; *Munj grass* "Saccharum Sara"; & *Kahi* "Saccharum Spontaneum" for the purpose of protecting the roadway embankments, from flood, wind and drift sand, and there is every reason to anticipate a steady increase in revenue yearly from the sale of these grasses and reeds.

Overseers and Jamadars were directed to use their utmost endeavours towards extending the aloe cultivation on the road sides.

The sowings of *Mahwa* "Bassia Latifolia", *Rajain* "Ulmus integrifolia", *Patajan* "Patajana Roxburghii" &c. &c., alluded to in a previous report were on the whole successful, and the saplings when large enough will be planted out in due course.

The "*Eucalyptus Tereticornis*" continues to do well and there are substantial grounds for anticipating complete success hereafter. The introduction of the *Eucalyptus* into India is at present only an experiment, but one which if it succeeds will be a great solution to the timber and fuel question, as it will afford great relief to the even now overworked Teak, Sal and Deodar forests both in the hills and the plains.

A good deal was done in the early part of the year in marking and blazing the useless and overcrowded trees on the following roads :—

Hoshiarpur to Dasuya	...	...	...	...	... 25 miles.
Chaulang to Nawshera	...	...	...	...	... 29 ,,
Dasuya to Talwara	...	...	...	...	... 22 ,,
Hoshiarpur to Rarra	...	...	...	...	... 27 ,,
do. to Garhshankar		...	...	...	... 25 ,,
				Total	... 128 miles.

Of the trees so marked a considerable number have already been disposed of either to private parties by public auction, or converted into fuel for brick and lime burning, and utilized on various works in progress from time to time, their value being charged against the work, and credited to the head of arboriculture. It may also be noted that increased attention is being bestowed by the establishment on pruning, a few severe examples were made, the result being the malis are very chary as to how they use their knives and saws. The mutilation and disfigurement of fine young saplings by indiscriminate hacking and cutting is now nearly unknown, no pruning is ever attempted unless under the direct supervision of overseer or jamadar.

During the early portion of last year about 16 acres of land were planted out in the "Cho" below Hoshiarpur with "munj grass" and "nara" expenditure *viz* Rs. 50, being borne by Municipal Committee. The heavy rains of last year did considerable damage to this plantation, but in January and February 1882 a sum of Rs. 100 was again sanctioned for this purpose, and a very large area over 50 acres was taken in hand.

The results arrived at being—

I. Protection to certain low lying mohallas of the town from flood.

II. The diversion of the channel of this torrent, which if unchecked threatens the existence of the town.

It will only be by perseverance and continuing these operations over a term of perhaps five or six years that success, more or less complete can be hoped for, and viewing the results obtained in other parts of the district there is no reason to anticipate failure.

The expenditure incurred during the current year was only Rs. 100.

Description of Work.—The progress has been satisfactory. The avenues on the main roads are rapidly approaching completion, and the heavy expenditure on account of extra establishment which has formed such a prominent feature in the operations hitherto, will it is hoped disappear as an item in arboricultural charges.

There will still remain however two large roads to be taken in hand *viz* :—

Hoshiarpur to Phagwarah *via* Mehtiana, Sham to Dhálbahá and Hariana 14 and 21 miles long respectively, though by a distribution of the "Personnel" these roads can be completed without any increase to the present establishment.

In the accompanying tabular statement it will be seen that 7½ miles only of new road has been taken in hand and planted out: the energies of the establishment being engaged chiefly in making good failures of previous years and filling up gaps. The total mileage in the district amounts to 438 miles 3 furlongs, of which, 263 miles 4 furlongs are planted out.

The following comparative statement shews the number of trees said to have been planted out during the year under review, and the percentage of failures.

	Roads.	Encamping grounds.	Gardens.
No. of trees planted in previous years...	1,13,960	18,887	7,989
Do. do. in 1881-82	8,795	4,937	3,608
Total ...	1,22,755	23,824	11,597
No. of trees that failed of those planted during the year ...	2,780	2,217	531
No. of trees now standing	1,19,975	11,607	11,066
Percentage of successful trees	68·2	55·0	85·29

There are in this district 14 encamping grounds with a total area of 479 acres, 2 roods, 8 poles.—76 acres, 3 roods, and 14 poles have been planted out during the current year, the chief operations being at Garhshankar, Mangowal, Churaru, Dasuya and Tanda.

Arrangements have been made for laying out a new encamping ground at a place called Damsúáh, midway between Unah and Mahilpur, on the new Mandi and Phagwara road.

Establishment and Supervision.—The establishment employed during 1881-82 consisted of 3 jamadars and 92 malis, distributed as follows :—

HOSHIARPUR TAHSIL.

1 Jamadar	@ Rs. 7 per mensem.
23 Malis	„ „ 4 „ „

GARHSHANKAR TAHSIL.

1 Jamadar	@ Rs. 7 per mensem.
22 Malis	„ „ 4 „ „

DASUYA TAHSIL.

1 Jamadar	@ Rs. 7 per mensem.
13 Malis	„ „ 5 „ „
9 Do.	„ „ 4-8 „ „
3 Do.	„ „ 4 „ „

UNAH INCLUDING AMB SUB-DIVISION.

1 Mali	@ Rs. 6 per mensem.
1 Do.	„ „ 5 „ „
19 Do.	„ „ 4 „ „
1 Do.	„ „ 2 „ „

This includes the malis in charge of the encamping grounds, gardens, &c., distributed as follows :—

	No. of Malis.
Hariana encamping ground	1
Bullowal „	1
Tanda „	1
Garhdiwala „	1
Mukerian „	1
Hajipur „	...
Talwára „	1
Garhshankar „	1
Mahalpur „	1
Una „	1
Nurpur „	1
Churaru „	1
Gagret „	1
Daulatpur „	1
Bharwain „	1
Hoshiarpur Tahsil garden	2
Dasuya „	1
Bankhandi Preserve	1
Sadr station	4

The establishment was supervised by the 4 sub-overseers and the Tahsildars, all of whom seem to have displayed a more or less intelligent interest on the subject.

FINANCIAL RESULTS.

Expenditure.	Hoshiarpur.	Dasuya.	Una.	Garhshankar.	Total.
Establishment	1,183	1,605	1,035	1,138	4,961
Tools &c.	...	...	44	...	44
Extra Establishment	180	198	166	336	880
Miscellaneous	86	93	86	78	343
Total ...	1,449	1,896	1,331	1,552	6,228
Income.					
By sale of dried timber	437	503	241	1,724	2,905
„ „ grass	33	69	480	62	644
„ „ khar kana	14	28	...	67	109
„ „ lac	69	83	44	100	296
„ „ fruit	12	32	10	4	58
Produce of Tahsil Gardens, Groves, &c. ...	614	75	4	15	708
Total ...	1,179	790	779	1,972	4,720

The amount realized from encamping grounds which is credited to Provincial Funds amounts to the sum of Rs. 1,721, being made up as follows:—

	Hoshiarpur.	Dasuya.	Una.	Garhshankar.	Total.
By farming land	571	62	543	202	1,378
„ Sale of grass	10	39	94	122	265
„ „ of lac	...	...	...	...	...
„ „ of timber	...	40	1	30	71
„ „ of fruit	1	1	5	...	7
Total ...	582	142	643	354	1,721

The income realized in 1880-81 amounted to Rs. 8,581. The income realized in current year from both sources amounts to Rs. 6,441, shewing a difference of Rs. 2,140 in favor of the previous year, this falling off, which is really only relative, being accounted for by the abnormally large sum realized from clearings in the Bullowal, Hariana, and Garhdiwala encamping grounds, as noted in last year's report.

12—KANGRA DISTRICT.

General Remarks.—I annex a tabular statement which will show the figures of the year under report as well as those of previous years.

You will observe from this statement that, up to the end of the year 1880-81, trees were planted on 289 miles of roadway and that, in the year under report, 52 miles were planted, making a total of 341 miles at the close of the year under report.

At Dharmsálá seeds of different kinds of trees were sown in about 1 acre 2 roods of land, and at Nurpur Mulberry cuttings were planted out on 2 roods. Khirk, Deodar and Chil have been planted at Dharmsálá. Mulberry trees grow well down at Nurpur, and are good for sericulture purposes.

No peculiar event, such as rainfall, drought, fire, &c., has occurred so as to especially affect arboriculture in the year under report.

Description of Work.—Avenues.—Under this head the Tahsildar of Hamirpur has done well. He has planted out roadside trees on 28 miles. The Kulu Tahsildar has also done well in planting out 21 miles. In Palampur little or nothing was done, but the matter is being earnestly attended to this year, and I hope that I shall be able to report next year that a considerable amount of roadway has been planted out, especially so as regards the line between Palampur and Baijnath.

The number of trees planted, as well as those which have died, is as follows :—

	Planted.	Died.
Nurpur	1,420	320
Kangra Dharmsálá }	5,969	500
Dehra	1,306	489
Hamirpur	14,591	2,000
Kulu	7,100	900
Total ...	30,386	4,209

Out of the trees planted 14 per cent died.

Whilst on this point, I would bring to your special notice that I consider the Tahsildar of Hamirpur, Lachhmi Sahai, merits praise for the industry he has exhibited in this important branch of his executive duties. Next to him I notice that the Tahsildar of Kulu, Mr. Joseph Golaknath, merits approval for his endeavours in the same cause. The Tahsildar of Kangra has given fair attention, but there is room for more diligence on his part in this respect. The Tahsildars of Dehra and Nurpur did not devote such attention to their duties; the latter, Moti Ram lacked in his usual diligence on the subject, whilst the Dehra Tahsildar has been changed two or three times in the year under report. I would not certainly blame the Tahsildar on this point, as it was only at an early Committee this year that the subject was brought very prominently to notice, and this has arisen from your observing, whilst on one or two tours with myself, that you did not consider that a proper and effective system had been kept up in this matter so as to ensure more certain success. Since then the attention of myself and the Committee has been given to the subject very fully, and arrangements have been made for nursery gardens, Malis, &c., and for each Tahsildar to plant out, with the most suitable trees, a distance (on any line in his Tahsil) of not less than 3 miles; this is now being done, and I hope to show a better result next year than I am able to do in the year under report.

The protection of trees is being carried out, and the instructions conveyed in your Circular No. 163—2096, dated 1st September 1881, as regards planting them *as well* have been read and fully explained to all Tahsildars in Committee. The Tahsildars thoroughly understand now that in the transplanting of trees the roots should be sufficiently covered with their mother soil; they are also being fenced in, in the mode directed by you. As a rule, no trees under 18 inches are transplanted. The system of lopping and pruning trees is being better attended to, and branches are now not lopped off unnecessarily, or torn off with ends left jagged, &c, &c.

The area under head of groves at the commencement of the year was 1 acre, 3 roods, 29 poles, of which 2 roods have been filled in with Mulberry cuttings at Nurpur, and about 1 acre of land has been planted with Chil, Deodar, Tosh, Kelu and Khirk at Dharmsálá. In these nurseries Nurpur shows a total of 11,800 Mulberry cuttings, and Dharmsala 3000 seedling.

Mr. Gladstone, late Judicial Assistant here, took much interest in arboriculture generally, and has got various Kotwals and Lambardars to embark in the scheme of tree-

rearing with a considerable amount of interest, and the Lambardars and Kotwals of the following places have promised to establish small nursery gardens in their respective circles :—

Jandrangal	Banuri
Chari	Noushehra
Jalalri	Khabli
Barsar	Raja Talao

These men have all been present in District Committee and have been informed that, if they really exert themselves in this important undertaking, they will be recommended to the Commissioner for sanads at next year's Imperial Darbar.

Establishment and Supervision.—The cost of the establishment, maintained for the supervision of groves and plantations at Rs. 180 per annum, has been the same as in the year preceding, Rs 470 have been expended on planting trees, &c., but in this year's budget we have been allowed Rs. 1,050 including Kulu, and I therefore hope for a better result next year.

Financial Results.—Receipts from the sale of trees on roadsides amounted to Rs. 250 against Rs. 59 in the year previous, and the expenditure incurred is shown at Rs. 650 against Rs. 695 in the preceding year, showing a deficit of Rs. 400 during the year.

In conclusion I would beg to state, that I am willing to admit there is ample scope for improvement, and that, as the Committee and all in this District are now more fully alive, (from the orders and instructions received from yourself so frequently on the subject) to the vast importance of greater attention being paid to matters under this head, I have every hope that they will now improve year by year.

AMRITSAR DIVISION.

Remarks by Commissioner.

The Deputy Commissioner of Sialkot writes, "a great deal in the way of arboriculture and horticulture has of late years been done, and is being done at private expense by the people all over the district. The people seem to have a natural taste for tree-planting which is fostered by the free distribution of trees from the Government gardens. District officers have in the course of their tours frequently noticed that gardens and orchards are springing up in every direction, and there is scarcely a village-well which has not got its small plantation or nursery."

Much has been done in past years in the way of planting trees useful for timber or shade; but not much, practically, to encourage the growth of good *fruit*-bearing trees, round villages and wells. Considering how wholesome and anti-scorbutic fruit is, I think there is a wide opening for usefulness in this direction.

At present there is a great dearth of fruit-bearing trees in agricultural districts. Well-to-do men, here and there, plant gardens of Oranges and such like trees; but I should like to see fruit trees growing generally in the fields along water courses and around wells.

Much, I think, might be done by District officers and District Committies in this direction.

I should like in particular to see good kinds of plantains introduced from Calcutta. The common Punjab plantain is a tasteless, mealy and comparatively worthless thing. Doubtless many superior varieties would thrive well in the Punjab.

13—AMRITSUR DISTRICT.

General Remarks.—A large number of young trees were put out during the year, and these were fenced in whenever necessary. As a rule, tough and shady trees are put out and are found to do very well in almost every place—perhaps the only place where they are difficult to push on is maria country, but efforts are being used to get them on there as well as elsewhere.

Description of Work.—The new works undertaken during the year consisted of planting single lines of trees on the following roads.

1 Amritsur-Sri Har Govindpur road.
2 ,, Majitha ,,
3 Attari-Chogowun ,,
4 Civil lines ,,

The blanks of other district roads have been filled up.

The plantations are well stocked with trees. The Sadr plantation suffered very much by the late heavy rains, but a large number of seedlings have been raised and cuttings put down. They are both thriving. The nurseries contain many young trees of all kinds—mostly shishum. The whole of the district is supplied from these nurseries. The trees are

generally planted out when one or two years old, the months of July and February being chosen for the operation. 1,630 trees have been given away during the year in addition to those planted on the roads.

The propositon of improving groves for convenience of travellers will be completed during the year. The total number of trees planted were 7,947, and the number of absolute failures 1,200, or about one in eight.

Establishment and Supervision.—The strength of establishment employed for maintenance of roadside trees was the same as last year. The avenues were frequently inspected. The work of lopping and pruning trees was found to be beneficial.

Financial Results.—The expenditure for the year under review was Rs. 7,933-0-0 against Rs. 7,160-0-0 for the previous year *viz* :—

I.—Rs. 1,200-0-0 from General Local Fund.
II.— „ 6,733-0-0 „ District Fund.

It includes the cost of transplanting, carriage of trees, thatching for shade and shelter in cold season, canal water revenue, ploughing nurseries, cost of manure, &c.

The total amount realized by sale of dry trees and branches was Rs. 1,753 against Rs. 900 realized during the last year. The cyclonic storm which visited the district in October 1881 rooted up a large number of trees, and injured others.

14.—GURDASPUR DISTRICT.

General Remarks.—Nothing extraordinary occurred during the year under report so as to call for special remarks. The rains were rather heavy during the year as compared with last year.

Description of Work.—The avenues and plantations are in good condition. The operations of the year were confined to the filling up of gaps up to the 5th mile on the more important of the roads in the District.

Three and a half furlongs of roads leading to the Gurdaspur Dâk Bungalow were for the first time planted with trees during the year under report.

The following tabular statement will show the number of trees planted during this as compared with the preceding year :—

	1880-81.	1881-82.
Roadside Trees ...	2,168	1,725
Gurdaspur Plantations ...	4,797	3,328
Roadside Trees ...	927	1,786
Batala Plantations ...	Nil	3,500
Roadside Trees ...	32	1,850
Pathankot Plantations ...	1,127	379
Roadside Trees ...	3,211	2,720
Shakargarh Plantations ...	662	577

Endeavours will be made next year to extend the work beyond the 5th mile of the roads.

Establishment and Supervision.—The following establishments were maintained for arboricultural purposes.

Government Gardens Sadr.

1.	Head Gardener	@ Rs. 8 per mensem.
1.	Second do.	„ „ 7 „
5.	Coolies	„ „ 25 „
2.	do. @ Rs. 4-8	„ „ 9 „

TAHSIL GARDEN.

1 Gardener ... ... @ Rs. 5 per mensem.

NURSERIES AT SADR.

Nursery Dâk Bungalow.

1 do. ... ... do.

SERAI NURSERY.

1 do. ... ... do.

TUN NURSERY.

1 do. ... ... do.

MANGO NURSERY.

1 do. ... ... do.

China Mulberry plantations.

3 Gardeners ... ... do. =Rs. 15

Tahsil Batala.

1 Gardener ... ... @ Rs. 5 per mensem.
1 Cooly ... ... „ „ 4 „

Tahsil Pathankot.

2 Gardeners ... @ Rs. 5 each per mensem = Rs. 10

Tahsil Shakargarh.

1 Gardener ... ... @ Rs. 5 per mensem = „ 5
1 do. ... ... „ „ 4 „ = „ 4

ESTABLISHMENT EMPLOYED ON ROAD SIDES.

Tahsil Gurdaspur.

						Rs.
2	Bhistis	on	Gurdaspur and Kalanaur Road	@ Rs. 5 per mensem	=	10
2	Do.	on	do. „ Trimu	do.	„	„ 10
2	Do.	on	do. „ Naushera	do.	„	„ 10
2	Do.	on	do. „ Bahrampur	do.	„	„ 10
2	Do.	on	do. „ Srigobindpur	do.	„	„ 10
2	Do.	on	do. „ Dinangar	do.	„	„ 10
1	Do.	on	do. „ Trimu	do.	„	„ 5
2	Gardeners	on	do. „ Talibpur	do.	„	„ 10
1	Do.	leading to Dâk Bungalow		do.	„	„ 5
5	Do.	on Station Road		do.	„	„ 25
1	Mate			@ Rs. 6	„	„ 6

TAHSIL BATALA.

						Rs.
4	Bhistis	on	Batala & Derananak Road	3 each @ Rs. 5 & 1 @ Rs. 4		=19
2	Do.	on	do. & Fattehgarh Road	each „ 5		„ 10
1	Do.	on	do. & Anarkalli	do. „ 5		„ 5
2	Do.	on	do. & Srigobindpur	do. „ 4		„ 8

TAHSIL PATHANKOT.

5 Bhistis on Pathankot and Mirthal Road @ Rs. 5 per mensem =25

TAHSIL SHAKARGARH.

2	Bhistis	on	Shakargarh and Chamal Road	each @ Rs. 5	per mensem		=10
1	Do.	on	do. and Nurkot	do. „ 5	„	„	5
1	Do.	on	Nurkot and Mundikhail	do. „ 5	„	„	5
1	Do.	on	Shahgharib and Kotnaina	do. „ 5	„	„	5
1	Do.	on	do. and Ikhlaspur	do. „ 5	„	„	5
3	Bhistis for 3 months each @ Rs. 5 per mensem					„	15
1	Mate @ Rs. 5 per mensem					„	5

The roadside plantations are under the supervision of tahsildars, district Engineer and overseer, while station gardens and nurseries were respectively under the supervision of an Extra Assistant Civil Surgeon and Deputy Commissioner.

Financial Results.—The subjoined statement will show the income and expenditure during the year under report :—

RECEIPTS.

Sale proceeds of fruits of gardens ...	... Rs.	456
Do. do. of grass ...	... „	23
Do. do. of roadside trees ...	... „	467
Total Rs. ...		946

EXPENDITURE.

Establishment of Government gardens at sadr & tahsil	Rs.	912
Pay of Bhishtis employed in watering roadside trees	„	2,456

CONTINGENCIES.

Water rent	... Rs.	134
Shed for gardeners	... „	135
Fodder for cattle	... „	240
Cost of a bullock	... „	30
Cost of covering mango trees ...	... „	40
Miscellaneous	... „	379
Total Rs. ...		4,326

15.—SIALKOT DISTRICT.

General Remarks.—The last was a favorable year for arboriculture, the rainfall was above the average and seasonable. No new work was however undertaken, it being considered of primary importance to complete existing avenues on roadsides, by filling up blanks and gaps caused by the renewal of fallen trees or the perishing young plants.

Description of Work.—There are nurseries on the Amritsar road at ten miles apart, but they have been a good deal neglected, and allowed to become choked up with over-grown plants and roots which were unfit for planting and had to be cleared away. Some of the ground has been re-sown with mango, bahera, tali, siris, and mulberry, and the remainder will be sown during the rains. There are some seedlings in one or two of these nurseries, but they are too young and will not be fit for transplanting for another year or so. Some plants were supplied this year for roadsides from the Civil gardens but the greater part were obtained from zamindars' wells or other places where they had been produced spontaneously. Such a source of supply cannot be depended upon, and arrangements will be made for providing a regular supply of plants by successive sowings and increasing the number of nurseries. Plants suffer much by being conveyed to any great distance and it is therefore necessary that there should be plantations on every roadway.

As soon as a young plant is put down it should be fenced with the *euphorbia*, a mud wall, or strong thorn bushes; this work is performed by the regular establishment, but in many cases it is neglected or done in so careless a manner as to be next to useless. Plants that need protection from frost are covered over with rice straw or Munj-grass.

The species of trees generally planted in this District are:—

SHISHAM, *or tali (Dalbergia Sissu)* ...	Thrives well.
MANGO ...	Grows well, but requires care and protection for some years.
MULBERRY	Thrives well only in "sailaba" land, requires watering for 3 or 4 years.
BAHERA *(Terininalia bellirica)*...	A handsome stately tree with large dark green foliage, bears a nut which is largely used for medical purposes, grows well and does not require much care.
SIRIS *(Acacia sirissa)* ...	Thrives well.
BER *(Ziziphus jujuba)* ...	Grows well.
DREK, *or* BAKAIN *(Melia sempervirens)* ...	Very quick growing, does not require much care but is very short lived and not worth planting.

KIKAR *(Acacia Arabica)* ... Hardy but affords little shade. Wood useful.

PHULAHI *(Acacia modesta)* ... By no means a handsome tree, and affords but little more shade than the kikar, the wood is useful.

The following useful as well as ornamental and fruit producing trees will also be planted wherever they are found to thrive :—

PIPAL *(Ficus religiosà)* ... Will grow almost anywhere in the district, with a little care.

BOHR *(Ficus Indica)* ... Will grow almost anywhere in the district with a little care.

SIMBAL *(Bombax hepaphyllum)* This is the silk cotton tree, grows well in the Bajwat and in "sailaba" land.

TUN (*Cedrela Tuna)* ... Thrives well in the Bajwat tract, requires watering and care for a few years, well worth the trouble.

NIM (*Melia Azadarachta)* ... Grows well in the Bajwat and in other parts of the district, requires watering and care as well as protection from frost three or four years.

PENTAPTERA AUGUSTIFOLLIA *(Native name not known)* ... A large tree with dense evergreen foliage, grows well, its wood is white and hard.

JAMAN (*Syzygum Jambolanum*) A handsome tree, well-known, thrives well all over the District ; requires care and watering as well as protection from frost for a couple of years or so. Produces an edible fruit. Well suited for roadside avenues or groves.

EUCALYPTUS SALIGUA ... Has done well in the Civil gardens and would grow well all over the Bajwat.

The tun, simbal, mango, mulberry and shisham grow magnificently all over the Bajwat tract. The planting of fruit-bearing trees will be encouraged as they would in the course of a few years yield a considerable income from the sale of fruit and repay all the trouble and expense taken in rearing them.

The lopping and pruning of trees is essential to their growth, but it is an operation that requires to be performed judiciously, the indiscriminate use of saw and pruning hook ruins a tree. Many of the crocked and misshapen trees met with on roadsides are the result of injudicious lopping. In this district, the trees are lopped twice a year under the supervision of the arboriculture darogha, strict orders are given to use nothing but the saw, and to lop little rather than much.

An arboriculture map showing all the lines of roadway the work already done in the district, *e. g.*, all existing avenues, groves, nurseries, plantations and gardens ; and what remains to be done, would be useful as a groundwork for future operations. I hope to be able to submit such a map with the next report.

A Sub-Committee of arboriculture composed of some of the most intelligent members of the District Committee, has been appointed to take all the above matters into consideration and to conduct operations on a regular system, to prepare an arboriculture scheme for the year, and to control the income and expenditure. It is hoped that with the next year's report a more complete list of the existing avenues and those which it is advisable to plant will be given. An attempt will also be made to obtain correct statistics of the number of trees already planted in avenues on each road, steps will be taken to secure the planting only of authorized trees of not less than 2 years of age. The planting of kikar, bakain, phulai, and ber will be prohibited except in places where nothing better will grow.

The operations of the year under review were supervised by tahsildars and naib tahsildars and the arboriculture overseer. The Deputy Commissioner and Assistants inspected the work done during their tours.

During the year 332 miles of double avenues were gone over and replenished with trees wherever there were blanks and gaps caused by failures of previous year, or the removal of decayed trees.

In the Sialkot tahsil 8,694 trees were planted in this way on ten roads of which about 84 per cent. are reported to have been successful.

In the Pasrur tahsil 15 roads or a length of ·108 miles were similarly planted with 5,460 trees with better success than in the Sialkot tahsil, only ten per cent. having failed.

In the Riah tahsil 50 miles were planted with 1,799 trees of which more than 15 per cent. perished. The rainfall in this tahsil is less than that of any other part of the district, and consequently arboriculture is carried on under greater difficulties. Some of the finer species of trees will not thrive.

In the Zafarwal tahsil the least work was done, 1,400 trees were planted on 28 miles of roadway, and the proportion of failures was far greater than elsewhere, apparently owing to insufficient watering and care during the dry months.

During the year about 500 fruit trees and flowering shrubs were planted with very few failures.

The nursery has been enlarged and is well stocked with cuttings and young plants. A large number of fruit trees have been grafted and will be ready for sale or distribution amongst the people of the district next spring.

A few grafted trees of choice varieties of vines, peaches and apricots have been obtained from Europe. Most of them arrived in good condition and are thriving. These will in time furnish good scions for grafting upon the country stock. New varieties of shrubs and fruit trees have also been procured from the Saharunpore and Lahore gardens.

This garden has now become entirly self supporting that is, the income credited to the District Fund is equal to the expenditure, and will in future years, I hope exceed it.

Much benefit is derived by the people of the district to whom fruit trees and shrubs are given gratis, during the year a thousand plants were distributed.

The experimental cultivation of *Eucalyptus* has been attended to with fair success, seeds of 4 or 5 varieties was sown in February 1881, and germinated well, especially the varieties *rohusta*, *rostrata*, *and saligna*, of the last named two hundred plants were planted by the Cantonment Committee in clumps about the station, and I believe this variety could be grown successfully all over the Bajwat. *Eucalyptus globulus* was found to be too tender and unsuited to the district although there are a few fair specimens in the Cantonments. Another variety which has done well is the *citridora* of which there are several thriving plants in the garden. About the close of last February a small quantity of seed of E. *resenifera*, E. *gigantia* and a variety said to grow well in the Hazara District was sown and the latter especially has germinated well and the seedlings are looking healthy.

Gardens are kept up at the head quarters of tahsils, where small nurseries are planted. Those at Zafarwal and Pasrur are well kept and contain some very fine fruit trees, and should yield a good income in the course of a few years.

On the off side of the bund which runs by the Aik Nalla 245 mango, shisham, and other trees have been planted successfully during the year. The soil is good and the trees are growing luxuriantly. The bund itself is planted with Munj grass which not only helps to bind the earth and prevent it from being abraded, but yields an income by sale of the reeds and grass.

The site of the Gulu Shah fair was planted with 500 trees chiefly shisham, mulberry, pipal and siris. These will in time afford shelter and shade for the visitors as well as the cattle brought to the fair.

A few trees chiefly mangoes were planted in the Katchery compound, on the road leading from the Katchery to the Bhed Bridge, Some tali and other timber trees were also planted on the Samrial encamping ground

Establishment and Supervision.—The following establishment for supervising, planting and watering trees, was kept up *viz*;—

		Rs.	Rs.
	For roadside plantation.		
6	Malis @ Rs. 5 each	320	
41	Bhistis do.	1,439	1,759
	At nurseries.		
2	Malis @ Rs. 5 each	107	
1	Cooly @ „ 4 for six months ...	24	131
	Site of Gulu Shah Fair.		
2	Bhistis @ Rs. 5 each	44	44
	On the Bund near Aik Nalla.		
1	Malie @ Rs. 5	60	
1	Cooly @ „ 4 for 10 month ...	40	100
	A Darogha or Overseer to supervise @ Rs. 25 per mensem		300
	Total Rs. ...		2,334

The bhisties are only employed for such times as they are really required.

Miscellaneous expenses.

	Rs.	
Fodder for bullocks at nurseries ...	135	
Price of plants	150	
Hire of conveying plants &c.	42	
Cutting up decayed trees	13	
Carts for carting decayed trees & loppings to godown	43	
Well gear, pots, ropes &c.	20	403
Grand total		Rs. 2,737

Financial Results.—The income has been as follows:—

By sale of decayed and fallen trees ...	Rs.	2,412
Do. do. tree loppings ...	„	1,985
Do. do. Munj grass ...	„	15
Total	Rs.	4,412
Expenditure as detailed above ...	„	2,737
Surplus or profit ...	Rs.	1,675

The income in 1880-81 was only Rs. 104 short of the outlay; in the year under review it has exceeded the expenditure and left a surplus or profit to the District Fund of Rs. 1,675, and it is gratifying to know that the greater part of this income was derived not from lopping but by the careful collection and sale of decayed and fallen trees.

An overseer was appointed last year especially for supervising arboriculture, who is expected to be constantly on the move, and it is a part of his duty to promptly report whenever he observes a decayed or up-rooted tree, and to see that it is speedily disposed of by auction on the spot, or removed to the godown if not too for off, and also to see that it is replaced by a young plant.

I think it is worth mentioning here that besides the work done at the public expense, a great deal in the way of arboriculture and horticulture has of late years been done and is being done, at private expense, by the people all over the district. The people seem to have a natural taste for tree-planting, which is fostered by the free distribution of trees from the Government gardens.

District officers have in the course of their tours frequently noticed that gardens and orchards are springing up in every direction, and there is scarcely a village well which has not got its small plantation or nursery.

Trees on roadsides are often damaged and destroyed by shepherds and others cutting down young shoots and small branches, with a pruning knife at the end of a long bamboo, or by beating down leaves and branches to feed their animals on, and a seedling if at all unprotected is sure to be nipped off. Measures have been taken to detect and prosecute all such offenders, and heavy fines have been imposed in many cases with good results.

16.—LAHORE DISTRICT.

General Remarks.—The rainfall was copious and seasonable, and the year was favorable for tree-planting.

Description of Work (A). *Avenues. Lahore tahsil.*—The statement shows that a mile of the Lahore-Hariki road has been newly planted during the year: 900 trees were planted, of which so many as 700 have died: 300 were planted to fill up the gaps in previous plantings, and of these 100 have perished. These operations cannot be considered as at all satisfactory, especially as a canal-cut runs along side of the road for some eight miles of its length, and irrigation must have been easy. That these discreditable results are in great measure due to the neglect of the establishment is certain.

But if these operations are unsatisfactory, the condition of the Mian Mir-Chabil road is deplorable. This road is reported to have been planted in previous years along its entire length of 5 miles, but the tahsildar reports that only 40 trees have survived the ravages of white ants and the effects of Sulphate of Soda in the soil. These trees, it is stated, have been saved by the influence of the canal near the village of Fatehgarh. The tahsildar under whose auspices these unsatisfactory results have been obtained is Mir Ghazanfar Ali, who has recently been selected for promotion to Extra Assistant Commissioner in Ferozpur District.

In the Sharakpur tahsil only one mile of road was planted, the trees being taken when about 3 feet high from nurseries in the tahsil garden and on the Mangtawala road. The tahsildar reports that he loses 25 per cent. of his plantings, and this is not a large proportion when trees are planted on roads removed from efficient supervision. The tahsildar, Tulsi Ram, takes interest in his avenues which are neatly kept.

The Tahsildar of Chunian, Muhammad Ashraf, gives no statistics of the trees that have died, and he will be called upon for explanation. He does not appear, however, to have been neglectful of the roads in his tahsil, for operations appear to have been carried on on several roads, and he has added 2½ miles to the avenues in his jurisdiction. I passed along one of these, the Chunian-Khudian road, and saw a very promising young avenue in March last.

The tahsildar of Kasur appears to have restricted his attention to the replacement of trees that have died from previous plantings. The returns do not seem to include the operations of the Kasur Municipality, and I know that Kadir Bakhsh Khan, Extra Assistant Commissioner in charge of this out-post, has done a lot in the way of arboriculture during the year under report. He will now be written to.

The tahsildar of Sharakpur has formed a third nursery in in his tahsil, near the village of Sangran, where he has planted 450 saplings. Tahsildars will be invited to direct their energies during the present rains to the formation of nurseries at central and convenient places, where lambardars and zaildars can be made responsible for their preservation. The cultivating class, as a rule, is apathetic, and shows but little interest in the progress of arboriculture.

Establishment and Supervision.—The following is a statement of the establishment employed and the expenditure incurred from District Funds on arboriculture. The establishment employed in the Lahore tahsil is too small to ensure successful operations, and the tahsildar will be directed to increase it, for Rs. 700 has been allotted for arboricultural operations in each tahsil, and in only one tahsil was this sum reached during the past year. I was new to the district and had to learn its requirements.

The system of paying zamindars for watering and tending trees planted in proximity to their property has my approval, and, if the supervising staff insists on regular and sufficient watering, success ought to follow. There is advantage to be gained by enlisting the co-operation of the tillers of the soil in the prosecution of arboricultural operations, especially in places remote from head quarters. The district overseer and sub-overseers of works are required to supervise the planting and tending of trees in addition to their other duties.

Tahsils.	Establishments.	Amount.			Total.			Remarks.
		Rs.	A.	P.	Rs.	A.	P.	
Lahore ...	1 Mali ...	72	0	0				
„ ...	2 „ ...	120	0	0				
					192	0	0	
Sharakpur ...	7 „ ...	336	0	0				
„ ...	3 „	204	0	0				
„ ...	Zamindars for watering, at 0-0-3 per 100 trees ...	364	0	0				
„ ...	Miscellaneous ...	2	8	0				
					906	8	0	
Chunian ...	2 Malis ...	140	0	0				For 14 months.
„ ...	1 „	30	0	0				For 6 months.
„ ...	7 Bhistis ...	280	7	0				
„ ...	Zamindars for watering,	45	9	0				
					496	0	0	
Kasur ...	2 Malis ...	120	0	0				
„ ...	5 Bhistis ...	292	0	0	412	0	0	
	Total Rs. ...	...	...	...	2,006	8	0	

Financial Results.—The expenditure on arboriculture will be found detailed above, and compared with which the income from sales of fallen trees and loppings is a mere fragment, leaving the financial results entirely on the debit side. But this must be expected. The receipts amounted to Rs. 330, the Kasur tahsil having contributed so much as Rs. 222 of this. Nothing was received from the Lahore Tahsil.

Appended is a memo. drawn up by the Secretary Municipal Committee, Lahore This of course does not include the action of the Agri-Horticultural Society, the Railway, or of private individuals. The results are much better than those obtained by tahsildars in district tree-planting, probably due to closer and easier supervision.

In this District there are a number of Rakhs and Plantations under the Forest Department, and canal plantations also, regarding which separate Departmental Reports are submitted. Though our roadside avenue returns, and particularly those of the Lahore Tahsil, may indicate lack of energy on the part of Tahsildars and myself, I am quite sure that tree-planting and spontaneous growth is widely on the increase everywhere.

Regarding the current year I hope to yield much more favorable returns. At present I don't believe a correct record of operations is kept, but tree-planting will henceforth be carried on on a system which I have been at some pains to impress on my subordinates.

Memo. by Secretary Municipal Committee, Lahore.

During 1881-82 the young trees on 25 roads, measuring 18 miles in length, which had been planted in previous years, were tended, and watered when necessary, and all gaps were filled up by planting other trees. A table is appended which gives the length of each road, and the kinds of trees on each. During the year 4,704 farash *(Tamarix articulata)* cuttings were planted on the roads, of which about one-half struck root, and 2,025 trees of other sorts, *viz.*, jaman, sissoo and tún were planted out, of which 1,030 died off from neglect of watering and other causes. After the close of the year a beginning was made in introducing the system of watering by burying earthern pots (gharras) in the ground near the plants, and keeping them full of water, which, if successful, will save much expense.

During the year, young plants were reared in the Anarkali gardens as follows :—

	No.
Sissoo	1,250
Tún	105
Kachnar	50
Pipal	460
Siris	130
Jaman	160
Eucalyptus	300
Eupheebia	300
Lagerstramia Reginae	66
Total ...	2,821

Establishment and Supervision.—The care of the trees is part of the work of the head gardener of the Municipal gardens in Anarkali, who draws Rs. 50 a month, and 2 malis are set apart and charged to roadside trees, and during the year a gang of beldars was employed for 2 months in planting. Other malis and mashkis give occasional service, but their duties are not distinct and they are charged in the garden establishment. The trees in the City gardens are looked after by the garden establishment.

Financial Results.

Revenue from sale of fallen trees and loppings from City gardens	Rs.	259	14	0
Do. „ on Station roads	„	118	7	6
Total ...	„	378	5	6

2nd—Expenditure.

2	Malis —@ Rs. 5 each for 12 months	„	120	0	0
20	Beldars „ „ 5 „ 2 „	„	194	11	6
	Carriage and contingences in planting trees	„	75	4	0
	Purchase of 2000 pots for plants	„	30	0	0
	Total ...	„	419	15	6
	Loss or net expenditure during the year ...	„	41	10	0

17.—FEROZPUR DISTRICT.

1.—The following Funds have been sanctioned for the year under report.

From Provincial Fund Rs. 840 for the salaries of one darogah, one jamadar and 8 chaprasis, Rs. 3,800 for watering the roadside trees of this district, Rs. 1,286 for trees grown on other places than the district roads, and Rs. 800 for contingencies.—

Total Rs. 6,726.

Altogether 37,847 trees have been planted whereof 7,227 have died *i. e.,* nearly 20 °/₀.

The following is a detail of the above trees planted on roadsides—18,719 whereof 5,924 have died.

Trees planted on other places than roadsides in the district 19,128 of which 1,303 have died. Thus out of the total number of trees *viz.*, 37,847 as many as 30,620 have been saved, in other words nearly 80 per cent. have survived of the total number planted during the year under report. I may here beg to state that had it not been for the inundation canals of this district not half of the young trees could have been saved as the rainfall was not only insufficient but the showers were not regular enough to suit the wants of the tender plants.

As the arboriculture establishment of the Mamdot State is also under my charge, I beg to state that 7,559 new trees have been planted during the year under report of which only about 15 per cent. have died, as a large proportion of the trees have been planted by the side of the Nawab's canal. In planting new trees care has been taken to take up only a mile or so, and when that was grown successfully, another mile was taken in hand and so on, a system, which has according to the experience of many, proved successful all over the Province.

As a precaution, I have adopted another plan to save young plants from destruction through *neglect* of the keepers, *viz.*, before passing the monthly pay-bill of the bhistis &c., I call for a statement showing how many trees have died within the various circles from such courses as are beyond the control of the keepers, and from this I can easily find out how many plants have met their destruction simply through the neglect of the men in charge, and accordingly I deduct one anna for a year old plant, and two annas for that of 2 years, and so on. Of course it cannot be excepted to pay for the loss, but I find by experience that by this check the men bestow more care on the young trees in their charge than they did heretofore.

18.—GUJRANWALA DISTRICT.

General Remarks.—There was no event such as abnormal rainfall, drought or fire &c. which specially affected arboriculture.

Description of Work.—The operations of the year were confined to the maintenance and preservation of old trees. Only 2 miles were planted with 1,048 new trees in the Hafizabad tahsil. The trees planted in previous years on different roads are reported to be in good condition. Blanks and gaps were filled where necessary on the roads planted before.

No new nurseries were planted during the year 1881-82 ; attention was chiefly paid to the tending and preservation of the trees planted in them in the previous year. The trees have grown from 3 to 4 feet high.

The same method of planting as described last year, *viz.*, planting young trees from nurseries into holes about 2 feet deep and fencing them with mud walls and thorns, and watering them 3 times a week. Shisham, siris, mulberry and kikar trees are generally preferred.

Lopping.—Is done with saw, and the loppings are sold by public auction.

Rare plants and trees.—A quantity of *Eucalyptus* seeds received from the Agri-Horticultural Society was experimentally sown in the Government garden in accordance with the instructions of the Society, but the seed did not germinate, and this unfavourable result was probably due to carelessness on the part of the gardener.

Establishment and Supervision.—The following table shows how the establishment was employed on the different roads in each tahsil :—

Tahsil and Road.	Detail.	Annual Cost.
		Rs.
Gujranwala to Hafizabad ...	1 Jamadar on Rs. 10 for 12 months ...	120
	2 Watchmen „ „ 5 for 1 „ ...	10
	24 Bhistis „ „ 4 for different months ...	964
	Total ...	1,094
Gujranwala to Ramnagar ...	4 Bhistis on „ 4 per mensem. ...	176
Gujranwala to Botala ...	3 „ „ „ 4 „ ...	96
„ „ Kila Mian Singh ...	1 „ „ „ 4 „ ...	32
„ „ Naushehra ...	1 „ „ „ 4 „ ...	30
„ „ Khiali ...	3 „ „ „ 4 „ ...	105
„ „ Sialkot ...	1 „ „ „ 4 „ ...	46
„ „ Shekhupura ...	1 Jamadar on „ 10 „ ...	120
„ „ Do. ...	12 Bhistis „ „ 4 „ ...	465
	Total ...	1,070
Gujranwala to Amritsar ...	1 Jamadar on „ 10 „ ...	80
„ to Do. ...	8 Bhistis on „ 4 „ ...	354
	Total ...	434
Station Roads ...	1 Mate on „ 5 „ ...	35
	4 Bhistis on „ 4 „ ...	217
	Total ...	252
	Grand Total Gujranwala Tahsil. ...	2,850
Wazirabad to Ramnagar ...	2 Bhistis on Rs. 4 per mensem. ...	78
Serai Gakkhar ...	1 „ „ „ 4 „ ...	48
Dâk Bungalow ...	1 „ „ „ 2 „ ...	12
Wazirabad ...	Miscellaneous expenditure. ...	9
	Total ...	147
Gujranwala to Hafizabad ...	4 Bhistis on Rs. 4 per mensem. ...	192
Mutteke Rest house ...	1 „ on „ 4 „ ...	48
Garden at Hafizabad ...	2 „ on „ 4 „ ...	96
	Total ...	336
	Grand Total. ...	3,333

The zaildars and naib tahsildars supervise the working of the establishment. The Deputy Commissioner and the other officers always inspect the trees planted out, during their tour during the cold season.

Financial Results,—The total outlay on arboriculture was Rs. 3,333 or Rs. 1,172 less than in the previous year. Rs. 216 were realized from the sale proceeds of loppings. The net expenditure was Rs. 3,117.

19.—RAWALPINDI DISTRICT.

The rainfall of the year having been insufficient like that of the year previous to the one under report, fresh plantings in most of the tahsils were not made excepting on those roads where trees had been planted the year before and had died.

In course of the year under report 5,133 trees were replaced in the Sadr tahsil.

In Attock tahsil	1,734	trees	planted.
„ Pindigheb	1,190	do.	do.
„ Fatehjang	720	„	„
„ Gujar Khan	11,921	„	„
„ Kahuta	2,853	„	„
„ Murree	Nil.		

Total replacements 23,551, of which 8,055 died, owing to the scarcity of rain ; giving a percentage of 34 loss.

The following is the correct number of plants thriving in each tahsil.

Rawalpindi or Sadr	tahsil	...	...	...	1,522
Attock	do.	...	...	...	1,734
Pindigheb	,,	...	...	...	1,190
Gujar Khan	,,	...	...	...	9,648
Kahuta	,,	...	...	...	1,298
Fatehjang	,,	...	...	...	104

The largest number of trees died is in Rawalpindi or Sadr tahsil and Fatehjang.

In Attock tahsil and Pindigheb no loss or damage has been shown, the trees were planted in February 1882 (*i.e.*) at the close of the Financial year, and the result, therefore, was not known. For the latter tahsil I beg to refer you to my report of 1880-81, that "in Pindigheb no road has been found fit for avenue planting, &c."

In Fatehjang tahsil on the road from Kali Pari to Chakri 51 trees were planted, all dried up before the rains set in. From Hun to Ranotra 549 trees were planted, they also, all dried. Special instructions were issued last summer and during my winter tour for formation of nurseries and for sowing broadcast during the ensuing rain.

At Rawalpindi on the road from Toolsha to Sudh seed is sown near 44 wells at the rate of one marla to each well (*all shisham*). On road from Kotha Kalan to Nara Sydan seeds of shisham, phulai and shree were sown on 18 marlas of land. From Sangjani to Banni 3 kanals 15 marlas of land were sown with shisham, shree, &c seed. All dried up before the rains set in. On the road from Peswal to Kolianpur 3 kanals of land were sown with shisham and phulai but unsuccessful.

At Attock tahsil on road from Hussen to Osman, shisham, phulai and kikar seed sown in six places. On the road from Bha to Fatehjang, shisham, kikar and Phulai seed sown in 5 places.

At Kahuta tahsil on the road from Bewar to Kullar, shisham were sown on 2 kanals 10 marlas of land. In 33 places on different roads shisham seed was sown, the result is not yet known.

At Gujar Khan tahsil. In 29 places of plantations 766 trees of different discriptions—kikar, phulai, shisham &c. were planted.

The following are the number of plantations in each tahsil *viz* :—

1. In Rawalpindi 21 roads furnished with 124 plantations, in all 2,660 trees, of shisham, phulai, kikar and dhrek.
2. In Attock 2 roads furnished with 7 plantations, 160 trees of tût, dhrek, kikar and shisham.
3. In Kahuta 6 roads furnished with 25 plantations, 597 trees shisham only.

The etablishment entertained for arboriculture is small in this district. The planting is done by the ordinary tahsil servants.

For the Sadr tahsil 3 bhistis are employed on Rs. 7 per month each.

Budget provision for arboriculture was Rs. 1,200, which owing to the unfavorable weather of the year under report Rs. 623 were expended, the balance was reappropriated as follows :—

Budget provision	...	...	...	Rs. 1,200
Expenditure	...	...	...	,, 623
			Balance Rs.	577

The balance Rs. 577 was reappropriated as detailed below :—

Station garden	...	...	...	Rs. 517
Public Works establishment	...	...	...	,, 60

The rain-gauge has all along been kept at tahsils Rawalpindi and Pindigheb; but since November last it has been supplied to the remaining tahsils of the district. The amount received and credited to Provincial Fund by sale of pruning of trees is Rs. 65-4-6.

20.—JHELUM DISTRICT.

General Remarks.—Owing to scarcity of rain, the planting of trees was not carried on to an extent that would have been otherwise practicable, many of the plants died for want of adequate moisture.

Description of Work.—In the Jhelum tahsil, sisso trees were planted on the sides of the roads mentioned in the tabular statement with the following results :—

Trees planted	... ...	1,471
Died	... ...	195
Succeeded	... ...	1,276

and in Pind Dadan Khan tahsil 878 trees were planted with successful results.

In Chakwal tahsil no planting occurred, while in Talagang tahsil 950 trees were planted on roadsides of which 506 died, and the remaining 444 are still thriving.

In Jhelum 9,000 cuttings were planted in the Public garden of which 1,015 died, and in Pind Dadan Khan garden 1,395 cuttings were planted of which 300 died. In Chakwal tahsil 510 cuttings were planted and have continued to thrive. And in Talagang tahsil 236 cuttings were planted of which only 80 died.

The following statement shows details of seedlings, cuttings and trees planted in the different tahsils :—

Tahsil.	Seedlings Sown.				Cuttings planted.			Trees planted on roadside.			Remarks.
	No. of seeds in maunds.	No. of trees grown.	No. of trees failed.	No. of trees succeeded.	No. of cuttings planted.	No. of cuttings failed.	No. of cuttings succeeded.	No. of trees planted.	No. of trees grown.	No. of trees died.	
Jhelum ...	10	53,000	39,000	14,000	9,000	1,015	7,985	1,471	1,276	195	
P. Ds. Khan,	...	...	...	...	1,395	300	1,095	878	878	...	
Chakwal ...	2	415	200	215	510	...	510	...	...	...	
Talagang ...	1	3,000	800	22,000	236	80	156	950	444	506	

The extent of previous planting in the district on avenues &c., is shown in column 5 of the statement already submitted, and extent of planting during the year in column 6 of the fresh plantings, about 24 plant cuttings died owing to drought.

Establishment and Supervision.—The undermentioned statement shows the details and pay of establishment employed :—

Name of Tahsils.	Place where employed.	Detail of Establishment.						Rate of Pay.						Remarks.
		Gardeners.	Coolies.	Bhisties.	Pakhalia.	Mates.	Jamadar.	Gardeners.	Coolies.	Bhisties.	Pakhalia.	Mates.	Jamadar.	
Jhelum ...	Garden ...	2	6	2	4	...	...	20 & 7	5	5	5	...	...	
	Nurseries ...	...	5	...	...	...	1	...	5	...	...	...	10	
	Plantation ...	...	5	...	...	1	...	...	5	...	...	7	...	
P. D. Khan,	Garden ...	1	3	...	...	...	...	15	5	...	...	...	...	
	Nurseries ...	...	7	...	...	1	...	...	5	...	...	5	...	
	Plantation ...	...	3	...	...	...	...	...	4	...	...	...	...	
Chakwal ...	Garden ...	1	1	1	...	...	...	10	5	5	...	...	...	
	Nurseries ...	...	2	...	...	1	...	...	5	...	...	5	...	
	Plantation ...	...	2	...	...	1	...	...	5	...	...	5	...	
Kalarkhar,	Garden ...	1	1	...	...	...	...	10	5	...	...	...	...	
Talagang,	Garden ...	1	2	...	...	...	...	6	5	...	...	...	...	
	Nurseries ...	...	4	...	...	1	...	...	5	...	...	5	...	
	Plantation ...	...	2	...	...	...	...	...	5	...	...	...	...	
	Total ...	6	43	3	4	5	1	...	...	...	...	...	...	

The best seasons for planting out are the months of February, July and August; the work in the above months is taken in hand in accordance with instructions issued to the establishment concerned. Young trees at least 6 feet high are chiefly transplanted to roadsides, as these trees thrive better than the smaller plants which are more liable to be destroyed by cattle. A ditch of about a foot in depth for the reception of water is made when planting trees, they are also fenced round for protection.

On the remote outlying roads in the district, trees planted or seedlings sown are always left to the care of village headmen under the supervision of tahsildars, who inspect them during their circuit in their respective tahsils. The district officers also inspect the plants during their tours.

There is a slight increase in the establishment over that of the preceding year, as noted below, for the better tending of work:—

Gardener	1
Coolies	12
Mates	2

Financial Results.—The following statement will show the total receipts and expenditure of the year under report:—

Name of Tahsil.	Receipts.			Charges.				Remarks.
	Tree cuttings.	Gardens.	Total.	Gardens.	Nurseries.	Planting.	Total.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Jhelum ...	564	565	1,129	2,323	454	513	3,290	
P. D. Khan ...	63	284	347	413	334	26	773	
Chakwál ...	69	114	183	423	105	178	706	
Talagang ...	17	28	45	310	163	139	612	
Total Rs.	713	991	1,704	3,469	1,056	856	5,381	

The income and expenditure compares thus with the preceding year:—

	Receipts.	Charges.
1881-82	Rs. 1,704	Rs. 5,381
1880-81	„ 903	„ 4,197
Difference =	„ 801	„ 1,184

The increase under these heads is due to increased attention to tree-lopping and the extra establishment as above noted being entertained.

Zamindars are encouraged through the District Committee to plant trees on their own account in the immediate vicinity of their villages, with a view to aid the administration in the arboriculture of the district.

21.—GUJRAT DISTRICT.

General Remarks.—In 1881-82 the rainfall was very beneficial for planting out trees, in consequence a large number of shisham and kikar trees were planted out on roadsides. In Gujrat there are no large tree plantations, and no fires have taken place, nor have any other events specially affecting arboriculture taken place.

Description of Work.—A large number of young shisham and kikar trees have been planted out in the gaps which occur on the roads noted below, wherever the trees had died out.

Shisham and kikar trees have been planted on the road from Gujrat towards Bhimber, in the gaps where required.

Shisham trees have been planted on the road from Gujrat towards Phalian in the gaps where required.

Shisham and mulberry trees have been planted on the road from Gujrat towards Jelalpur in the gaps where required.

Shisham trees have been planted on the road from Gujrat towards Shahdiwal in the gaps where required.

In 1881-82 no new groves, nurseries or plantations have been planted out.

At Gujrat there is a small nursery in the Church garden—from this nursery 500 young shisham, mulberry and kikar trees have been planted out with great success.

Establishment and Supervision.—The establishment given below has been maintained for planting young trees, watering and fencing them, *i. e.*—

1	Jamadar	@ Rs. 8	per mensem=	Rs. 96	per annum.
5	Coolies	„ „ 5 each	do.	„ 300	do.
1	Chaukidar for watching roadside trees	„ „ 5	do.	„ 60	do.
			Total	„ 456	

In addition to the above establishment, the temporary establishment given below was employed during the year :—

2	Bhistis for 6 months ...	@ Rs. 5 each	per mensem=	Rs. 60	per annum.
	Contingencies			„ 57 14 6	
			Total	„ 117 14 6	
			GRAND TOTAL.	„ 573 14 6	

during the year 1881-82.

The district overseer Chamba Mull has been carefully supervising the planting, transplanting, and the watering of the young plants in the nursery and on the roadsides.

Separate establishments have not been employed for separate works, except the establishment noticed in para 7.

Financial Results.—Rs. 1,000 was allotted for arboricultural purposes in 1881-82; out of this sum Rs 573 14 6 have been spent, and Rs. 426 1 6 the unspent balance, lapsed to Government at the end of the financial year.

22.—SHAHPUR DISTRICT.

General Remarks.—The rainfall in tahsil Shahpur was slightly in excess of that of the preceding year, but there was a decrease in the rainfall in tahsil Bhera, while that in tahsil Khushab was the same as last year, hence the year under report was not more favorable for tree-planting than 1880-81.

Efforts were however made to plant trees and to sow kikar and other seeds in the following places with partial success :—

Name of locality.	Total Number of trees planted.	Number of trees successfully planted.
Description of Work.—Road to Kachewala ferry ...	702	598
Road from Thati Raja to Sahiwal ...	500	350
„ Bhera to Badshahpur ...	2,500	1,000
„ Khushab to Nurewala ...	300	200
„ Khushab to Junction of Katha road	50	35
„ Khushab to Karelwala, kikar and shisham seed sown ...	...	800
Plot between Police Station and Civil Station ...	12,000	9,500
Encamping-ground Bhera „ „ Chak Ramdas } ...	22,600	4,200
Plot around the tank at Khushab ...	200	75
„ near Tahsil at „ ...	200	160
Chakkajar	Seed of kikar and shisham sown in 50 acres.	1,000

I have not yet been able to verify these tahsil reports.

Besides the above, 5 nursery gardens in tahsil Khushab and, 4 station gardens at Sadr were maintained.

Establishment and Supervision.—The station gardens at Sadr are under the charge of the Judicial Assistant, and the nursery gardens in tashil Khushab and roadside avenues &c. are supervised by the tahsildars.

The establishment kept up during the year under report was :—

GARDENS.

7 Malis @ Rs. 6 to 10 per mensem.
20 Coolies @ „ 4-8 and 5 ditto.

ROADSIDE TREES.

3 Bhistis @ Rs. 5 each.
4 Chaukidars ditto.

An overseer who was sent to Changa Manga for training in plantation work has just returned after finishing his course, and it is hoped that future plantations which will be carried out under his supervision will be more successful than those tried hitherto. To push on the work of tree-planting in this district, I have lately sent another man for training at Changa Manga, and now that a portion of the Khushab rakh can be irrigated from Corbynwali canal; I expect soon to see that rakh which is at present without a tree in it, converted into a nice fuel producing rakh in the district.

Financial Results—The income from sale of dried and fallen trees along roadsides amounted to Rs. 2,751, from sale of garden fruits, to Rs. 176 against, Rs. 78 and 307 respectively, in the year 1880-81.

The expenditute of the year under report was Rs. 3,910-5-5 as follows :—

	Rs.	A.	P.
Station Gardens	1,503	1	10
Nursery Gardens	762	14	0
Temporary establishment of coolies and other contingent charges	1,029	5	8
Roadside trees establishment	494	15	11
Subscription to Agri-Horticultural Society ...	120	0	0
Total Rs. ...	3,910	5	5

The above figures show a deficit of Rs. 3,459.

MOOLTAN DIVISION.

Remarks by Commissioner.

The very large expenditure in Muzaffargarh seems scarcely justified by the results, but as the Deputy Commissioner is watching it, it may be left to him for the present.

The Deputy Commissioner of Jhang mentions in the last para. of his report, that there are some 171 plantations in his district varying from 5 to 10 acres planted with kikar trees the property of zamindars, who were encouraged to plant them for firewood for the river steamers. These are entered in the settlement papers as in possession of Government, and he proposes to purchase some of these from zamindars, and to gradually plant them with shisham trees cutting, and selling the kikar trees. As I consider the proposal a good one, I beg to recommend the same, and to ask for special orders on the subject.

Owing to the marked rainlessness of this whole Division, principally Mooltan and Muzaffargarh, tree-planting is rendered especially difficult, for a tree will rarely have a chance of absorbing atmospheric moisture through its leaves, which is a material help elsewhere. To this should be added the abundance of camels in this region, which can always, in passing by nibble off the leading shoots, and the indifference of the people to trees. Not being accustomed to trees, they do not know their value, and are even more than elsewhere indifferent to the success of tree-growing. I am of opinion that the work of making trees grow hereabouts is almost hopeless till the people become our helpers in it.

23.—MOOLTAN DISTRICT.

General Remarks.—The average of rainfall throughout the district was 4·2. In this district owing to the scantiness of the rainfall, the planting of trees except in the immediate vicinity of wells and canals can only result in failure; and even in favorable localities each tree requires a constant care which it is almost impossible to obtain for it. The employment of the enormous establishment required to give this care would be ruinous, and the attempt which has been made to secure the co-operation of the zamindars by giving them 0-2-3 per tree alive at the end of the year has not been a success, a mile of road planted with trees on each side at a distance of 5 yards apart would thus contain 1,408 trees,

and would cost Rs. 198 a year to maintain. Even this large sum hardly gives sufficient payment to the zamindar, the frontage of whose land on the road would hardly exceed ⅛th of a mile, and would thus bring him in about Rs. 2 per month. In practice he would not get even this, for in very few places is there a clear run of a mile of young trees each only 5 yards apart.

There is also extreme difficulty in obtaining really trustworthy reports of the trees for which payment should be made, and in seeing the money properly disbursed. The District Committee have, therefore decided to confine their action as much as possible to maintaining existing avenues, and to encourage as far as possible the planting of kikar and other hardy trees by the zamindars in their own fields, as near as possible to the roadside—with this view, kikar seed has been distributed gratis, and sanads have been given to the zamindars declaring the trees thus sown to be absolutely their own property. This system has not been sufficiently long in use to say how far it will be successful.

Description of Work.—The work of the year consisted as in the past year of filling up gaps along old roadside avenues, forming new avenues and stocking the nurseries with new plants.

114 trees were planted along two of the roads in this tahsil to fill up gaps, these trees are reported to be thriving. The only new work undertaken was that of planting 1 mile of road round part of the city with young shisham plants. These plants being of about 2 years' growth, have all taken root and are thriving with the exception of five.

In this tahsil gaps were filled up along 5 miles of road with 390 plants, and one new mile of roadway was planted with 110 young trees. Of the whole number of 500 trees planted in the tahsil 405 died.

26 miles of roadway had their gaps filled up in this tahsil with 717 trees, of which 667 died.

Gaps along 55 miles of road in the Mailsi tahsil, were filled up with 4,665 trees, and those along 12 miles of the Serai Sidhu tahsil with 1,000 trees. In the former, including the trees planted last year so many as 5,123 trees perished owing partly to the sterile soil, and partly to destruction from white ants. The percentage of failures was about 90 for the whole district, out of the 7,486 trees planted. The trees consisted of bor, pipal, shisham, kikar, mulberry and plum, and in a few cases of siris and farash &c.

The compound of the Dâk Bunglow which is very carefully looked after was stocked, with 3,270 young plants of the orange, mulberry, pipal, bhor and kikar.

The nurseries at Lodhran and Serai Sidhu were kept up, in the former 1,225 new plants were raised, and in the latter 1,000.

In tahsil Mailsi a nursery was formed for the first time, and 2,800 young plants were raised.

In all 8,295 young plants were raised in the different nurseries, of these 975 died being about 11 per cent.

Establishment and Supervision.—The establishment consists of :—

2	Jamadars on Rs. 8 each, one at Mooltan the other at Lodhran...	Rs.	184
1	Mali trained at Changa Manga at Rs. 8 per mensem ...	„	96
1	Mali at Serai Sidhu on Rs. 7 per mensem	„	84
3	Malis on Rs. 6 each, one in Tahsil Mooltan, and two in Tahsil Mailsi— less savings ...	Rs.	215
8	Malis at „ 5 each....		
	Tahsil Mooltan ... 1 Do. Serai Sidhu ... 1 Do. Lodhran ... 4 Do. Mailsi ... 2 — Less savings	„	435
	One Mali on Rs. 3 at Tahsil Mooltan—Rávan	„	36
	An assistant at Mailsi on Re. 1-8 per mensem	„	18
	Total ...	„	1,068

The supervision has rested with the tahsildars, the Deputy Commissioner taking notice of the work, done in his winter tour.

Financial Results.—Besides cost of establishment, the following expenditure was incurred.

Cost of watering roadside trees or remuneration to zamindars for watering trees, 3 pies per mensem for each tree in tahsil Mooltan and 2 pies per tree in other tahsils	...	...	Rs.	625
Fodder for bullocks for the well at Serai Sidhu	...	...	„	48
Do. Do. Lodhran...	...	...	„	81
Do. Do. Mailsi ...	...	...	„	39
Subscription to Agri-Horticultural Society per annum ...		...	„	240
Repairs to earthen enclosures for trees ...	...	..	„	6
Exchange of a bullock	...	...	„	8
		Total ...	Rs.	2,115

24.—JHANG DISTRICT.

General Remarks.—The rainfall this year was up to the recorded average, but the district is a dry one, and continuous avenues are impossible. The head nursery at the Sadr which I found 2 years ago in a backward condition is now well stocked, but the experience of 2 years, has shewn me that the soil is too stiff to allow the young trees to develope as quickly as they would do in a lighter soil, and I am therefore making a small nursery on the banks of the Karora nullah, a mile from the Sadr, where the soil is light and the water close to the surface. In the meantime the fine Sajhawal plantation, which I closed last year to cattle, will furnish us with an abundant supply of young shishams, large enough to plant out.

I hope next spring to plant out no trees under 5 feet in height.

The trees hitherto planted in avenues have been chiefly shishams and siris, with a small proportion of banyan, pipal, kikar and jaman.

Kikar and siris are not planted now, and a larger proportion of pipal and banyan are being brought forward in the nurseries. Mangoes of good kinds I hope in a year or two to be able to supply to zamindars at their wells, and also good vines.

Description of Work.—455 trees were planted out to fill up gaps in existing avenues—and 186 trees planted in former years died during the year.

About 32 miles of roads in the district are partially planted with trees, but the avenues are only continuous for short distances, as trees cannot be kept up except in the immediate neighbourhood of wells.

The only exception is the fine Karora avenue which extends about 3 miles along the nullah of that name.

16,660 young trees have been raised in the Sadr nursery, which is now well stocked with 21,910 young trees.

The large number of grafted mango trees procured last year from Lahore, Saharanpur &c., only a small proportion of which have died, have had country stocks planted near them, ready for inarching, as soon as the trees have grown sufficiently.

The experiment of planting the Karora nullah bank with willow cuttings, commenced in the previous year, was continued in the year under report, but though the slips took root in great numbers, I find they are all dead now. The first year's planting are flourishing and are now 8 to 10 feet high. The experiment will be continued during these rains.

Establishment and Supervision.—The following is the schedule of establishment and supervision employed for the different works.

Station Gardens.				Rs.	A.	P.
18 Gardeners ...	@ Rs. 86-4-9 per mensem ...			1,035	9	7
23 Gardeners, Bhistis &c. employed on avenues @ Rs. 105-10-8 per mensem ...	...	...	...	1,268	0	0
Water suppliers paid annually ...	...	...		332	14	9
		Total Rs.	...	2,636	8	4

Supervision was carried on at Sadr nursery garden as last year by one head gardener under the immediate control of the Deputy Commissioner and for station roadsides by 2 Local Fund peons; and the other avenues, groves and plantations &c.; are kept in order by the owners of wells who are paid monthly and yearly for watering and looking after the trees. They are under the immediate supervision of the tahsildars.

Financial Results.—The total expenditure under the head arboriculture amounted to Rs. 3,676-1-1 as detailed below :—

	Rs.	A.	P.
Pay of malis and bhistis &c.	2,636	8	4
Feed of bullocks	300	0	0
Purchase of bullocks	177	8	0
Fencing trees by mud walls	200	0	0
Miscellaneous expenditure	362	0	9
Total ...	3,676	1	1

The income was Rs. 500-7-6 as shewn below :—

	Rs.	A.	P.
Garden produce	329	7	6
Sale proceeds of loppings	135	8	9
Miscellaneous	35	7	3
Total ...	500	7	6

Although there is a deficit of Rs. 3,175-9-7 as compared with the expenditure of the year, still there was an increase of Rs. 340-11-0 in the income as compared with the last year.

The garden income has nearly trebled, and will gradually increase. The valuable fruit-trees now being raised will be eagerly purchased by the zamindars, who continually petition me to let them buy fruit-trees.

As I mentioned in my last year's report a large sum should have been realized from the sale of thinnings in the Sajhawal plantation, but I was transferred, and the thinning was not carried out. It will be done this year and in following years.

I may mention that there are some 171 plantations varying in size from 5 to 10 acres in the district, planted with kikar trees. These are the property of zamindars, who were encouraged to plant them to supply firewood to the river steamers.

These are entered in settlement papers as in possession of Government. It might be advisable to select some of the better plantations, purchase out the zamindars, and plant the plantations with shisham, gradually cutting down and selling the kikar trees. Otherwise these plantations will soon disappear.

25.—MONTGOMERY DISTRICT.

General Remarks.—Rainfall.—	1880-81	1881-82
Montgomery ...	11·6	11·4
Gugera	6·4	19·7
Dipalpur... ...	5·4	16·6
Pakpattan ...	7·2	13·9
Total	30·6	61·6

Or largely in excess of that of the preceding year and quite sufficient for arboricultural operations.

Fires.—Nil.

In this district white ants are very destructive, and do much more damage than they could do if water were plentiful.

Description of Work—Avenues.—The work done during the year under this head consisted of planting trees on a mile of station road and replacing dead trees wherever required.

The percentage of trees successfully planted was about 50; the condition of the avenues was generally good.

That a large portion of the undernoted roads remains unplanted,

Montgomery to Pakpattan	... ...	27 miles
Okarah to Dipalpur	... ...	32 „
Montgomery	... ...	10 „

is due chiefly to scarcity of water along the roadsides.

The only places where topes exist are, Gugera and Atari. At both these the trees are large and require no particular care.

At other places the plantations are of lesser growth and require tending.

The nurseries are kept stocked with young trees which are planted out to replace dead ones on roads &c.

The kinds of trees sown or planted are generally, shisham, kikar, pipal, bohar, mango, mulberry and a few fruit-trees.

Establishment and Supervision.—The following establishment was maintained during the year and the expenditure thereon amounted to Rs. 815-0-0 as follows: —

MONTGOMERY TAHSIL.

		Rs.	A.	P.		Rs.
1	Contractor for watering trees at Chichawatni at	10	0	0	per month	120
1	Mali	„ 6	0	0	„	72
2	Coolies	„ 5	0	0 each	„	120
2	Coolies	„ 2	8	0 „	„	60
3	Bhistis	„ 5	0	0 „	„	180
1	Do.	„ 5	0	0	for 7 months	34
				Total. ...		586

GUGERA TAHSIL.

						Rs.
1	Bhisti	„ 5	0	0	per month	60
1	Do.	„ 5	0	0	for 5 months	25

DIPALPUR TAHSIL.

1	Contractor for watering trees at Rs. 10 0 0 per month	120

PAKPATTAN TAHSIL.

1	Contractor for watering trees for 6 months at Rs. 4 per month	24
	Total expenditure on establishment	815

The establishment at Montgomery has worked under the supervision of the Deputy Commissioner and those in tahsils under that of tahsildars.

Financial Results.—There were no receipts from arboriculture. The charges were as follows :—

	Rs.
Maintenance of establishment as detailed above	815
Wages of prisoners for digging and planting trees	258
Price of bullocks	70
Buckets &c.	63
Railway fare for seeds	2
Wages paid to carpenters &c., for repairing well ...	172
Gram for bullocks	22
Total expenditure ...	1,402

26.—MUZAFFARGARH DISTRICT.

The rainfall was 4·93 inches. This was very small, and a large staff of malis and bhistis was maintained to supply water to the young trees. Considering the amount of expense entailed on the District Funds by tree-planting in this district, great progress should have been made. But except in Alipur tahsil where the tahsildar has taken great pains and has spent to the greatest advantage all money allowed him, I cannot say the result is satisfactory. It appears to be impossible to overcome the hopeless laziness and incapacity of the bhistis of the district and after a fair trial, I have been obliged to come to the conclusion, that for the future the sums wasted so far on the bhistis will be spent better through the zamindars who are ready to take the matter up.

There are four principal roads in the district namely :—

(1).—The Sher Shah-Dera Ghazi Khan.

(2).—The Muzaffargarh-Alipur Road.

(3).—The Muzaffargarh-Rangpur Road.

(4).—The Muzaffargarh-Ahsanpur Road *via* Mahmud Kote.

All the important towns in the district are situated on these lines, and all the cross roads branch off from them.

Thus there is the largest traffic on them and the planting avenues on them is of the greatest importance. The Dera Ghazi Khan road is in charge of the Public Works Department. The following figures show the progress made on the other roads up to March 1882.

		Miles planted.	*Miles unplanted.*
(1)	Muzaffargarh—Rampur Road ...	6½	42⅓
(2)	,, —Alipur Road :—		
	(1)—Muzaffargarh to Aludiwala ...	12	13
	(2)—Aludiwala to Shar Sultan ...	1½	6
	(3)—Shar Sultan to Alipur ...	7/201	8/27
(3)	Mahmud Kote—Ahsanpur Road ...	6¾	29¼
	Total ...	33¾	98¾

Thus out of a total length of 132½ miles, 98¾ miles are unplanted, and much of what has been planted is not doing well. It is not only the bhistis who are to blame, but those who had the task of supervising them. The tahsildars now thoroughly understand what they have to do, and it is to be hoped that they will do better than they have done. Arrangements are being made for sowing with shisham trees the banks of canal distributaries.

The most suitable tree for this district is the shisham. Siris, mango, pipal, bor and kikar, also grow well. Among indigenous trees are the jhand, farash and karil.

Sufficient protection was not given to the trees, and those fences that were put round the young trees were not satisfactory. The tahsildars have been warned to be more careful. Arrangements for establishing ample nurseries have been made, and some of the young trees have come on, and are coming on very well. There ought, before long, to be an ample supply of seedlings.

Description of Work.—The following is a record of the work done during the year under report :—

Name of Road or Plot.	No. of trees and miles planted.		No. of trees in good condition.	Percentage in good condition.
	Miles.	Trees.		
AVENUES.				
Muzaffargarh-Rangpur Road	* 6½	200	185	92·5
,, -Aludiwali Road *via* Khangarh ...	* 12	115	107	93·04
Road from Taleri garden to junction with Khangarh Road ...	* 3	50	45	90
Road from Ganeshwah Bridge to Taleri garden ...	* 1	25	25	100
,, from Ganeshwah Bridge to Police Court ...	* ½	95	68	71·58
,, from Dispensary to junction with Dera Ghazi Khan Road.	* 1½	130	107	83·308
Station Roads	* 1½	60	60	100·
Road from Muzaffargarh to Kinjhar *via* Shahgarh	† ½	130	91	70
Mahmud Kote-Ahsanpur Road	† ¾	1,410	864	61·28
Sanawan-Koreshi Road	† ½	305	155	50·82
Rakhanwali Shar Sultan Road	† 1	367	164	44·68
Shar Sultan-Alipur Road	† 2½	2,175	2,175	100· (These are in excellent condition.)
Jatoi-Alipur Road	* 1	620	620	100· (These are in excellent condition.)
Khairpur-Alipur Road	* ½	532	532	100· (These are in excellent condition.)
Shar Sultan-Jatoi Road	† 1/20	426	352	82·86
Circular road at Alipur	* 2/8	241	232	* † 96·207
,, ,, at Jatoi	† 2	1,077	880	81·708
,, ,, at Khairpur	† ⅜	415	160	38·55
Road from Kandrala ferry to Alipur	18 kanals or 1/50 mile.	36	36	100· † The report is up to 31st March 1882.
Total ...	36 18/20	8,409	6,858	81·55

* Length of Road planted last year, but the trees in some gaps not having come up replanted this year.

† Ditto newly planted during the year under report.

PARTICULARS.	No. of miles and trees.		Trees in good condition.	Percentage in good condition.
	Area.	Trees planted.		
Groves.				
Taleri Garden ...	...	240	240	100
Grove on Koreshi Road ...	...	46	46	100
Cemetery Plot ...	...	Shisham	seed sown.	
Miththuwala Well ...	...	60	60	100
Grove near Khangarh encamping-ground ...	...			
Jarh Grove ...	...			
Thatta Sealan Grove	...	Shisham	seed sown.	
Langar Serai Grove ...	...			
Waliwah Grove ...	...			
Sanawan Garden ...	...	41	41	100
Kot Adu encamping-ground ...	...	120	90	75
,, School Garden ...	...	30	24	80
Lowland at Alipur ...	...	132	82	62·12
Compound of Stallion stables Alipur ...	...	Shisham	seed sown.	
Khairpur encamping-ground ...	...	192	74 & Shisham seed sown.	38·54
Garden at Ghilwan ...	...	1,510	1,510	100
Total ...	...	2,371	2,167	91·39
Total Avenues ...	8¼ miles.	8,409	6,858	
Total Work ...	8¼ ,,	10,780	9,025	

It will be seen from this statement that the new work done during the year was satisfactory in a very partial degree.

8¼ new miles were nominally planted and numerous blanks in existing avenues were nominally filled, but the work was not well done for the most part.

Plots of land were sown with shisham seed in the places noted below :—

1. Jarh.
2. Thatta Sealan.
3. Langar serai.
4. Walliwah canal.
5. Cemetery.
6. Khangarh encamping-ground.
7. Khairpur encamping-ground.
8. Compound of Stallion stables at Alipur.

Trees were planted in nine other gardens, groves, and encamping-grounds. 10,780 trees planted, out of which 9,025 trees are said to be in good condition. This is however, an exaggeration.

Of the shisham seed sown in plots noted above, that in Langar serai and on the Walliwah, may be said to be a partial success. The Walliwah plantation promises to be an excellent scheme, the seed sown at Langar serai has done very well considering everything.

A large supply of fruit-trees was obtained from the gardens of the Agri-Horticultural Society Punjab, and distributed to the gardens at head quarters, and at Sanawan, and Kot Adu. During the year under report, a Government rakh situated close to the Walliwah canal, on the Mahmud Kot Road which was lying waste was levelled and sown with shisham and siris, at an initial cost of Rs. 430.

It was divided into three plots, in two of which the seed germinated well, in the third it did not succeed well at first, it was sown a second time and fared better.

There are nine young nurseries in the district at the places noted in the margin*.

* (1) Moradabad grove.
(2) Jarh grove.
(3) Thatta Sealan grove.
(4) Langar serai.
(5) Walliwah grove.
(6) Kot Adu School orchard.
(7) Lowland at Alipur.
(8) Compound of Stallion stables.
(9) Orchard at Ghilwan.

Establishment and Supervision.—The cost of the establishment maintained during the year for planting operations was Rs. 4,256-13-4 and consisted of :—

1 Jamadar.
65 Malis and Beldars.
39 Bhistis.

Owing to the failure of this establishment to work efficiently after repeated warnings the whole establishment has been thoroughly revised.

The tahsildars are ordered to exercise supervision within their respective tahsils.

They are assisted by their assistants, and each is allowed a moharrir and a mistri to look after the trees and works generally. The district officers during their tours in the cold weather inspect the arboricultural operations.

Financial Results.—The financial results are as follows :—

Income.

	Rs.	As.	P.
Sale of garden fruits and vegetables	280	0	0
Sale of old trees	854	6	4
TOTAL RS. ...	1,134	6	4

Expenditure.

	Rs.	As.	P.
Pay of bhistis and malis	4,256	13	4
Clearing kasses and repairing, and sinking wells ...	485	13	0
Feed of bullocks	1,673	14	2
Implements, pots, ropes, water skins &c.	382	6	0
Subscription to Agri-Horticultural Society	240	0	0
Purchase of donkeys and bullocks	596	0	0
Purchase of manure	81	7	6
Other improvements	28	10	3
Purchase of trees and seeds	445	8	6
Brick enclosure around trees	390	5	9
Clearing rakhs &c.	510	12	2
Total Rs. ...	9,091	10	8
Deficit ...	7,957	4	4

The tahsildars have been warned that this large expenditure will not be allowed unless more satisfactory results are obtained.

The income of Taleri garden has fallen off partly owing to a disease that has attacked mango trees, and partly owing to the incapacity and laziness of the men employed in the gardens. The mango blossoms are attacked and destroyed by an insect known as "Tela." The Conservator of Forests Punjab, was consulted, with the view of obtaining instructions for preventing this destruction, but as specimens of the insect could not be sent for his inspection at the time, the reference was closed.

28.—DERA ISMAIL KHAN DISTRICT.

General Remarks.—The rainfall varies from 7·14 to 10·23 inches and is of little use for tree-planting operations.

Description of Work.—Trunk road from Dera Ismail Khan to Bannu.—Six hundred and forty trees were planted during the year under review, out of which forty trees died and will be replaced. The work was pushed on near the Sadr station throughout last cold weather with great energy and success. The real difficulty is to keep the growing trees alive throughout the hot weather. The station supply of Luni water in May and June dwindles away to less than half a jandar, and is not sufficient for the scanty irrigation of the trees planted in former years and the large area now under grass.

Dera and Tank Road.—Three thousand eight hundred and ninety-seven trees were planted along 7 miles of this road, and as there is now a constant flow of water along the greater part of the road, the trees planted are alive and flourishing. Only one hundred and ninety five trees died and will be replaced.

Kalur Kot and Kot Sultan Road.—One thousand one hundred and ten trees were planted during the year on 2 miles of this road. One hundred and ten trees died and will be replaced. The remaining trees are doing well.

Bhakkar and Jhang Road.—Two thousand and seventy-three trees were planted on this road out of which two hundred and seventy-three died for want of water. The line is partly double and in places where it is double the "tree" is often a "stick" of tamarisk. These sticks have been planted on the average at an interval of 1½ yards.

There are 44 groves of 2 kanals each in this district. They are at convenient distances from each other. The trees are grown up and are unfit for transplanting operations. The trees where water is procurable are in a flourishing state.

Establishment and Supervision.—The following permanent establishment was employed during the year :—

1 Darogha, 1 Jamadar, 18 Malis.

The tahsildars exercise the necessary supervision.

Financial Results.

Receipts	...	...	Nil.
Charges	...	...	Rs. 1,690-10-11

28.—DERA GHAZI KHAN DISTRICT.

General Remarks.—Nil.

Description of Work.—Roadside avenues were extended during the year by 6¾ miles, 4¾ miles in the Dera, and 2 miles in the Rajanpur tahsil. One mile of the extension was on the road leading from the station to Dera Ismail Khan. This road is now planted for a distance of 4½ miles. On the Sheru road the extension was for a distance of 1½ miles, making in all 7½ miles planted. On the Jampur section of the Rajanpur road 2 miles were extended, making 16 miles in all. In the Rajanpur tahsil the extension of 2 miles was on the Hamunwala section of the Rajanpur road.

The number of trees planted on these 6¾ miles was 1,700, almost all shisham. A little kikar had to be planted on those portions where the land was impregnated with kallar. In filling up of gaps about a thousand trees were planted.

The number of nurseries maintained for obtaining supplies of plants for roadside planting was the same as last year—6.

On the Kot Chutta Road.	...	...	3
On the Sheru Road.	...	...	1
On the Sakhi Sarwar Road.	...	...	1
On the Dera Ismail Khan Road.	...	...	1

In addition to these nurseries the plantation at Kot Haibat was considerably extended. It is now about 30 acres in extent. About 2,500 trees were newly planted. The plantation contains between 6 and 7,000 trees (*Shishams,* and *Eucalyptus Resinifera* principally), and about half as many more trees will be planted during September, nearly a thousand *Eucalyptus* plants are now ready for putting out, and the roadside nurseries contain almost an inexhaustible supply of young shishams, from which the plantation will be stocked.

It will thus be seen that in all 5,200 trees were planted out during the year.

In previous years it was reported that large nurseries of fruit-trees were being maintained in the Kutcherry garden, plants from which were distributed to zamindars. It is most satisfactory to report that no less than 2,000 trees were so distributed during the year under report, the greater number of which were mangoes and jaman trees best suited for zamindars, as they give in time both shade and fruit. One zaildar Ahmad Shah of Pir Adil was given 200 mango plants as he engaged to lay out at least half of these on a roadside plantation.

These mango plantations, as has been previously observed, are to form a prominent feature in arboricultural operations of the district. Zamindars will receive every encouragement to get them up and the District Fund itself will contribute for the formation of some. As a beginning during the year under report, a plantation of this nature was commenced, as an arboricultural undertaking, on the Rajanpur road midway between Dera Ghazi Khan and Kot Chutta.

The gardens at Fort Munro in the Suliman hills are doing well and have been somewhat extended. These gardens, as has previously been noticed, are stocked with fruit-trees of every description, both European and Indian, suitable to a hill climate, as also timber such as, pines, oaks, chestnuts &c.

Establishment and Supervision.—On the Dera Ghazi Khan and Rajanpur sections in all 48 Bhistis were employed on watering roadside trees.

Financial Results.—Expenditure.—The expenditure during the year from all sources (District, Municipal and Provincial) amounted to Rs. 4,938 against 4,497 of the previous year.

29.—BANNU DISTRICT.

General Remarks.—The rainfall was less even than in the preceding year.

Description of Work.—Bannu.—No special report received from the tahsildar.

Lakki.—520 trees planted during the year, 373 with success or 69 per cent. These were all to fill up gaps in roadside avenues.

Isa Khel.—204 trees planted during the year to fill up roadside gaps of which 12 died, and 192 or 95 per cent. survived.

Mianwali.—210 trees were planted during the year about the new Civil station, all are doing well, as supervision can be constantly maintained. 150 trees died however of those planted in previous years.

Planting is done during February, March and August, lopping in December and January in each year. Care has always been taken to thin out the trees when it seemed necessary.

Establishment and Supervision.—There are altogether 15 malis on roadside trees, 2 in the station garden at Mianwali and one at the nursery at serai Naurang as will be seen from the detailed statement below:—

Locality.	Malis.	Rate per month.	Total per month.	Annual Total.	Expended during the year.
		Rs.			
Bunnu Roads	6	5	30	360	360
Lakki Roads	5	5	25	300	300
Isa Khel Roads	2	4	8	96	96
Mianwali Roads	2	5	10	120	110
Naurang Serai	1	6	6	72	72
Station Gardens	2	5	10	120	120
Total ...	18	30	89	1,068	1,058

Financial Results.

Locality.	Income from sale of trees.	Expenditure.				Gardens.	Deficit.
		Roads	Nursery.				
			Establishment.	Contingent.	Total.	Establishment.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Bannu	...	360	...	...	...	...	360
Lakki	28	300	...	...	...	...	272
Isa Khel	86	96	...	...	...	...	10
Mianwali	...	110	...	...	...	120	230
Naurang	...	...	72	79	151	...	151
Total ...	114	866	72	79	151	120	1,023

My views on tree-planting in this district were given at length in last year's report, but I have not been able to carry them out during the past cold weather as, for most of the time I was in camp Cis-Indus in Mianwali. As I am about to leave the district on furlough, I can only hope that my successor will have more leisure to attend to the subject than I have had during the last 4 years.

PESHAWAR DIVISION.

Remarks by Commissioner.

In the Peshawar district not only has a large number of trees been planted out, but the small percentage of failures, 14 per cent, is most satisfactory. Mr. Beckett's personal taste for these matters has much to do with increasing the energy of his tahsildars, and District Committee. But these also deserve credit for the success, and the interest shown in the plantation by the Committee is exceptional.

In Kohat both the climate and the nature of the soil preclude much action. In Hazara, the general failure is attributed to a deficiency in the rainfall during May and June 1882, which is said to have killed at least half of the 9,500 trees planted out during the previous January and February. Major McNeile's attention appears to have been awaked to the subject and I hope for better results next year. It is satisfactory to note that zamindars are indenting largely upon the Government nurseries for young trees.

30.—PESHAWAR DISTRICT.

General Remarks.—The Months of March and August are found the most suitable for transplanting; pruning is done in August, fencing consists of mud enclosures, and the trees preferred for planting are the shisham, mulberry, siris, ghaz and willow; the new trees planted out were successful, no heavy rain or drought had affected the arboriculture during the year.

Description of Work.—28,040 trees of various descriptions were planted throughout the district during the year under review at a cost of Rs. 4,652 or 3,541 Rs. below last year's expenditure. This large decrease was attributable to the reduction of unnecessary establishment at the recommendation of the Sub-Committee, appointed by Resolution No. 13 passed at a meeting of the Peshawar District Fund Committee, assembled on the 30th April 1881. The following is the detail of trees planted out on the district roads.

Tahsil Peshawar—		
Nissutta Road	1,200	
Bara Road	1,000	
Circular Road	1,500	
Urmur Road	1,200	
Phandu Road	800	
Edgah Road	600	
Jubba Road	400	
Garhi Sirdar Road	600	
Bhana Mari Road	400	
Charperiza	500	
		8,200
Tahsil Mardan—		
Shahbaz Gura Road	1,200	
Khai Road	1,124	
Jelala Road	2,501	
Mangan Road	700	
Dasura Road	600	
Guri Kapura Road	600	
Akora Road	1,928	
Rustam Road	1,696	
Dispensary Road	360	
Rushkai Road	970	
Hoti Road	445	
Kalpani Road	791	
		12,915
Tahsil Utman Balak—		
Topi Road	420	
Jehangera Road	602	
		1,022
Tahsil Hushtnagar—		
Kheski to Abazai	1,300	
Charsadda to Nisutta	2,900	
		4,200

Tahsil Daudzai.

Mardan	Road	...	...	201	
Hashtnagur	,,	...	...	158	
Charperiza	,,	...	...	140	
Mathra	,,	...	...	105	
Darbangi	,,	...	...	68	
Michni	,,	...	...	57	
Sarikh	,,	...	...	310	
Kangra	,,	...	...	664	
					1,703
			Total		28,040

For procuring young plants for the roadsides, 12 new nurseries were established at different places. Throughout the year trees and plants have been flourshing and watered when necessary, and where no canals existed, water bags "mashks" were supplied to men in charge of these trees for the purpose of watering them. Among the trees planted out during the year, no less than 86·12 per cent. were successful.

Establishment and Supervision.—The strength and cost of the establishment employed for the different works were as follows :—

				Rs.	
1	Jamadar	@Rs. 12 per mensem	...	144	
3	do.	@ ,, 10 each do.	...	360	
1	Mali	@ ,, 9 per mensem	...	108	
1	Mali	@ ,, 8 do. for 5 months		40	
1	do.	@ ,, 7 do. ...	...	84	
24	do.	@ ,, 6 each per mensem	...	1,728	
1	do.	@ ,, 6 for one month	...	6	
34	do.	@ ,, 5 each per mensem	...	2,040	
1	do.	@ ,, 5 do. for 9 months		45	
1	do.	@ ,, 4 do. ...	...	48	
Planting Nurseries		...	...	29	
Sinking four kutcha wells on Charperiza Road			...	20	
					4,652

The above establishment had worked under the control of the tahsildars of the district, and was supervised by the members of the District Committee in their respective circles, to whom the tahsildars had entrusted this work.

Financial Results.—The following is the detail of receipts and expenditure :—

		Rs.
Receipts.—Sale proceed of tree-branches	...	50
Expenditure.—As per detail given in para 4	...	4,652
	Deficit	4,602

Jhil Plantation.—As requested by the Conservator of Forests, Punjab, I note here the receipts and charges on account of this plantation—

Receipts.

	Rs.	A.	P.	
Balance in hand on 1st April 1880 ...	2	10	9	
Received from the Assistant Conservator, Punjab	192	0	0	
Total				194 10 9

Expenditure.

1	Jamadar	@ Rs. 10 per mensem	...	120	
1	Chaukidar	@ ,, 6 do.	...	72	192-0-0
			Balance		2-10 9

I would add here that Rs. 1,056 realized from sale of grass and reeds were duly credited to Government under head of "Forest Remittances," it will he thus seen that efforts have been made to work the plantation with as much economy and profit as possible

31.—HAZARA DISTRICT.

General Remarks.—Trees are planted out in this district towards the close of winter *i. e.* between the 1st January and 15th February.

The trees planted out in January and February 1881 reported on in last year's report have done comparatively well.

In 1881-82 rainfall during the planting out season was meagre, but the rainfall during the spring gave about 98°/₀ of the trees planted out new leaves, and induced a hope that this year's planting would be a decided success.

From the 21st April 1882 to the 14th May, there was no rain; and during May only 6 tenths with 9. 3, and 6 tenths so far in June at Abbottabad, Haripur and Mansahra respectively; and the season which opened so well has proved an exceptionally dry one. As always occurs in this district when rainfall is scarce water supply has run very low, water even for drinking purposes being obtained with difficulty. It would appear from late countings near head quarters that over 50°/₀ of the trees planted out last winter *i. e.*, in January and February 1882 have died, as have about 20°/₀ of those planted out in 1881, and if rain does not fall soon, there will be but little hope of any surviving, especially in the Civil Rakh. It would have been a useless waste to entertain bhistis. In this district trees are planted out with little care, for if the rainfall is good and seasonable, the greater part of the trees planted out take, however badly transplanted, while if, as this year, rain holds off, care in transplanting is of little avail. Arrangements have however been made to try pot culture with four men, without interfering with the existing nurseries of Haripur, Sultanpur, Abbottabad, Mansahra, Shinkiari and the Civil Rakh at Abbottabad.

It is hoped that pot grown trees will establish themselves quicker than transplanted trees, and thus make them more independent of short rainfall in May and June; and will be of use where it is necessary to carry the trees long distances from the nurseries.

It is proposed to follow the directions laid down in Dr. Henderson's pamphlet, amended to suit the district, and if it succeeds, extend pot culture and abolish the nurseries. Besides short rainfall the zamindars are a great drawback to tree-planting, and unless carefully watched, by shaking the newly transplanted trees backwards and forwards destroy it. This will not be so easy with a pot grown tree.

Large quantities of seed can be supplied from this district if timely notice is given. Lists are available.

Description of Work.—Avenues have been planted along 17 miles of road, and the gaps in 19¾ miles have been filled up; 9,446 trees have been planted, but as mentioned under general remarks it is doubtful if even 50°/₀ will survive the present drought.

In the nurseries 4,524 trees have been planted out, and 6 maunds of seeds have been sown.

In the Haripur gardens 1,529 trees have been planted out. In the Abbottabad garden young trees have been planted in beds, and arrangements are being made to start pot culture.

For next season it is proposed to plant the gaps in the 36¾ miles of road already planted, and if possible put new trees on the 18½ miles unplanted.

Establishment and Supervision.—The establishment entertained was:—

1 Jamadar at Abbottabad, and 1 at Haripur.—		
At Abbottabad Garden, ...	6	Malis.
do Nurseries, Road and Rakh ...	5	,,
At Haripur Gardens and Nurseries	10	,,
In Mansahra Tahsil Nursery	1	,,
In Shinkiari ,, ...	1	,,
At Sultanpur ,, ...	1	,,

There was one man for a month on the Mansahra and Shinkiari road.
Tree-planting has been done under the supervision of the tahsildars.

Financial Results.—

	Rs.
Income.—From sale of fruits and vegetables ...	1,864
Sale of Grass from Civil Rakh, Abbottabad	18
Sale of loppings	13
Miscellaneous	8
Total ...	1,903

This is exclusive of income from sale of grass and sweepings from encamping grounds credited to Provincial Revenue *viz* :—

		Rs. 64
Expenditure.—	Pay of permanent establishment ...	1,728
	do. Temporary establishment ...	5
	Annual subscription to Agri-Horticultural Society	120
	Planting out trees	416
	Cost of maintenance of gardens, tools, seeds, &c.,	364
	Total .. Rs.	2,633
	Deficit ... „	666

But with regard to this deficit it must be remembered that the roads now under the Public Works Department in this district were all well planted with trees from Local Funds and now give no returns at all in loppings or fallen timber to the Funds from which the heavy expense of planting them, was met. All the roads remaining in the hands of the Local Funds are being planted with young trees, and none are old enough to give returns. The Civil Rakh at Abbottabad is all barren hillside with no water supply; trees are beginning to show themselves and it is hoped to make a small forest of it by and bye. Market gardening pays, and helps to a great extent to support the tree-planting operations in this district, which is so expensive in its infancy. The trees in the gardens being mostly fruit-trees or trees kept for shade or ornament, do not give appreciable returns except in fruit.
It may be worth noting, that lately zamindars are apparently beginning to appriciate arboriculture for themselves, from the growing demand for young trees at the nurseries, which are given without fees.

32.—KOHAT DISTRICT.

General Remarks.—No peculiar events occurred during the year worthy of special mention. The rainfall 13·9 in 1881-82, was very insufficient, and not much has been done in the way of planting fresh trees during the year.

Description of Work.—The work carried out was the planting of fresh, and the maintenance of existing trees, on roadsides in general. The following species of trees were planted during the year under report.—

Mulberry	Sarin.
Shisham	"Akhor"
Wallon	"Kuliar"
"Rakh"	

Mulberry and shisham are mostly planted.

The number of trees planted is 956, of these 798 were planted on roadsides, and 158 in groves and gardens, of the former about 80 per cent. were successful, while of the latter 90 per cent. were so.

Establishment and Supervision.—The following establisnment including a jamadar to supervise the arboriculture was kept to look after, and water the trees :—

1	Jamadar	... @ Rs.	7 per mensem
4	Look-afters	... „ „	5 „
2	Bhistis	... „ „	5 „

Financial Results.—There were no receipts during the year. The charges of establishment &c., amounted to Rs. 402-6 which were borne by the District Funds.

II.—CANAL ARBORICULTURE.

1.—Bari Doab, Division.

General Remarks.—The year was one of abnormally heavy rainfall continuing from July well into September, and exceeding the average fall at most stations by 50% or upwards. This was beneficial to the young trees but it entirely destroyed seed sown about a couple of months previously on the Kasur and Sobraon branches.

Description of Work.—On the main canal and main branch upper planting operations were confined to filling up gaps in the road avenue trees. On the Kasur and Sobraon branches the new work consisted in planting out either two or three lines of trees on each side of the canal as the space allowed from Pakoki to Kacha Pakka, a length of 22 miles. The distance apart was 25′. 16,500 young shisham trees were planted out, of which 88% lived, no planting out was done on the Sobraon branch.

Planting done during previous years has been successful, and very cheap for the work done. There has been a good deal of friction in getting along without fencing. There are now three continuous lines of trees from the head of the Kasur branch, to within 8 miles of its tail, a length of 53 miles, and from the head of the Sobraon branch to the Grand Trunk road, a distance of 31 miles.

Planting out on the trench system did not succeed so well owing to the heavy rainfall.

Establishment and Supervision.—On the main canal (30 miles) and main branch upper (25 miles) the establishment employed consisted of, 1 mali at Rs. 7-4-0 a month, and 1 at Rs. 5 a month, 6 bhistis at Rs. 5, 3 beldars at Rs. 4-8-0.

On the Kasur branch from the head to the Grand Trunk Road, a distance of 32 miles, 1 mali at Rs. 6-0-0 a month and 13 beldars at Rs. 5-0-0 a month, were employed watering the trees from the water-courses; on the Sobraon branch, from the head to the Grand Trunk Road, a distance of 31 miles, 1 mali, at Rs. 6 and 11 beldars at Rs. 5 a month were employed.

The planting out done on the Kasur branch below the Grand Trunk road was done by special temporary establishment.

The establishment for looking after the young trees below the Grand Trunk road, on the Kasur branch, during the remainder of the year consisted, of 1 mali at Rs. 6 a month, 5 beldars at Rs. 5 a month.

General supervision was done by the Executive Engineer, Sub-divisional officer and by a trained Forester.

Financial Results.—On the old parts of the Canal, the Main Canal and Main Branch Upper :—

	Rs. A. P.
The expenditure on planting out was	200-0-0
„ maintenance	401-11-2
TOTAL	601-11-2
The receipts amounted to	4,203-12-1
On the new branches the expenditure on planting out was	10,406-14-7
The expenditure on maintenance	3,719-2-0
TOTAL	14,126-0-7
The receipts amounted to	1,875-4-4
The total expenditure on all parts was	14,727-11-9
„ „ receipts	6,079-0-9

2.—BARI DOAB, 2ND DIVISION.

General Remarks.—The operations during the year under review were, maintaining the existing plantations on the Canal, and replanting some spoil banks where it could be conveniently done.

Description of Work.—Establishment for the maintenance of line trees was entertained; the existing line of trees was kept in order and gaps, where trees had died, were filled in. 385 trees were planted in gaps between Aliwal and Buggelo, Lahore Branch, and 388 on Main Branch Lower Aliwal to Dodeli.

One mate was maintained in each chauki compound. The compounds were kept free from jungle. Fruit-trees were also planted in some of the first class chauki compounds; 89 young trees were obtained from the Agri Horticultural Society Lahore, and planted in Neaz Beg chauki compound.

The Gundian chauki compound was also planted with 40 fruit-trees.

The following area, out of the 209 acres of spoil banks shown to exist in an unplanted state in this division, and to be capable of irrigation, was sown during the year.

B. M.	52	54	M. B. Lower,	Right Banks	10·8 acres.	Seedlings above ground.
Do.	156	162	do.	do.	12·6 ,,	do.
Do.	155	162	do.	Left ,,	6·6 ,,	do.
Do.	233	235	do.	do. ,,	3·9 ,,	Promise fairly.
Do.	348	349	do.	Right ,,	2·4 ,,	do.
Do.	400	401	do.	Left ,,	2·3 ,,	do.
Neaz Beg Lahore Branch, both Banks,					24·0 ,,	Germinated.
				Total	... 53·6 acres.	

Fencing for these plantations to protect them from cattle, will be provided in 1882-83.

Establishment and Supervision.—An establishment costing nearly Rs. 250 per month was maintained for the plantations. The work was carried out under the ordinary canal establishment (overseers and sub-overseers).

Financial Results.—Are exhibited in the table given below :—

Receipts.

Sale of wood, grass, and other Canal produce ...	... Rs. 8,057

Expenditure.

Maintenance Canal plantation	... ,, 2,125
Replanting spoil banks	... ,, 1,888
Total	... ,, 4,013

The above shows that the income was nearly double the expenditure.

3.—Upper Sutlej Inundation Canals.

General Remarks.—The supply in the canals being favourable, the trees on the banks received a good watering. The trees carried away by the strong current, and those overhanging the canal banks, were cut and removed at a cost of Rs. 2,512.

Description of Work.—The trees on the canals are of spontaneous growth. The trees planted in the compounds of the Gudar, Malkana, Ladhawal, Banga Hyat and Lodian chaukis a few years ago were tended and watered. 161 new trees planted in the compound of the Tola chauki, and looked after.

Establishment and Supervision.—Four bhistis at Rs. 5 and one at 4 per mensem, were employed during the year, one for each chauki compound mentioned above. Their work was supervised by the subordinates in charge of the canals.

Financial Results.—The income derived during the year was as follows :

	Rs.	A.	P.
By sale of wood	570	0	2
Do. grass	1,803	8	0
Total ...	2,373	8	2
Deduct expenditure	3,021	14	9
Net loss ...	648	6	7

A large quantity of wood remained on hand at the end of the official year. It is hoped this will all be disposed of and the apparent loss for the year fully recouped.

These canals running in almost rainless districts and carrying a supply of water during only a portion of the year, cannot have their banks and "spoils" planted out systematically without a large expenditure, which the capital account cannot sustain. The value of fuel and timber in this part of the country is so low, that the cost would be more than the worth of the plantation. The chief part of the income in this division is derived from the sale of sarkanda grass, of which there is a copious growth on these canals, and which is in much demand by the zamindars.

4.—Lower Sutlej and Chenab Inundation Canals.

General Remarks.—No new planting operations have been undertaken during the year.

The large increase shown as receipts for sale of wood over last year, is due to the widening of the Bukhtuwah Canal, as before this could be done, it was necessary to cut down a large number of shisham and other trees which were growing at the water's edge on the left bank.

Description of Work.—Watering young trees on Chenab Bund and in chauki compounds. For the former bhistis have to be employed throughout the year. The trees in the compounds are watered by wells.

Establishment and Supervision.—One beldar at Rs. 6 and 19 bhistis and beldars at Rs. 5 per mensem for 12 months.

One pair of bullocks for Kehror compound at Rs. 15 per mensem.

Financial Results.—

		Rs.	A.	P.
Receipts.				
Sale of wood	...	10,596	9	9
do. loong and sirkana	...	3,314	3	3
do. fruit	...	94	8	6
do. crops	...	31	10	0
Total Rs.	...	14,036	15	6
Expenditure.				
Watering trees &c.	...	1,197	9	8
Surplus	...	12,839	5	10

5.—INDUS CANALS (DERA GHAZI KHAN.)

General Remarks.—Nothing occurred during the year to call for any special remark.

Description of Work.—The only new avenue planted during the year was that on the Kuliwala Bund. The avenues on the Sohan Canal, on the Islam branch of the Nur Canal and on the Dhundi Canal were extended. Besides this, the old plantations and avenues were kept up and maintained; dead trees being replaced and gaps filled up by fresh plants. A considerable number of trees died during the year partly from frost or reh, but chiefly owing to carelessness on the part of bhistis in not giving sufficient water and in not keeping off the cattle &c.

Establishment and Supervision.—The establishment consisted of 3 malis on Rs. 6, and an average number of 30 bhistis on Rs. 5 per month. The bhistis are sometimes employed in planting out as well as watering.

The men were mostly supervised by the sub-overseers under the Assistant Engineer. It appears to be difficult to get the sub-overseers to understand that it is a part of their duty to look after the plantations, and they apparently do little towards keeping the malis and bhistis up to their work.

One of the sub-divisional officers reports that since the dismissal of the foresters the trees had not been properly seen to.

Financial Results.—The receipts and expenditure during the year have been as follows:—

SUB-DIVISION.	Receipts.	Expenditure.	Profit.	Loss.	
	Rs. A. P.	Rs. A P.	Rs. A. P.		
Northern or D. Ghazi Khan Divison ...	1,918 4 0	1,509 0 3	409 3 9	...	Net loss— Rs. 400-12-3
Rajanpur ...	332 0 0	1,141 0 0	...	809 0 0	

or, for the whole division, a net loss of Rs. 400-12-3.

The large receipts in the northern sub-division are due chiefly to the sale of timber—Rs. 1,768-11-8.

The other items being rent of land, and sale of crops, seeds and mangoes.

The Sub-divisional Officer of the Rajanpur Sub-division reports that as the plantation operations have been in progress for the last seven years only, the trees are still too small and young to be valuable as timber.

Since 1877 the number of trees no longer requiring watering, &c. has increased by 4,606, at a cost of Rs. 7,382 ; *i. e.* about Re. 1-8 per tree, which is only a fractional part of the value of the tree when fully grown, "as scarcely any further expenditure will be necessary on these trees and as they are sufficiently well grown to render their deaths improbable, the result may be considered satisfactory, in spite of the large number of trees which have died."

6.—Sirhind Canal, Main Line Division.

General Remarks.—Beyond "barani" sowings on the "spoil" very little plantation work has been attempted during the past year, the available funds being too limited.

No attempt at renewing trees in the existing plantations was made, and with one or two exceptions no avenue trees were planted. The nursery work was confined to planting mangoes and the (*bis tendu*), bastard ebony.

There are still large areas available for sowing, and as soon as the water is admitted into the canal, work will be commenced on a regular system.

Description of Work.—The fresh spoils of 4 miles canal, Budki torrent outfall, Siswan approach channel and Daher diversion have been sown with kikar and shisham. These have all succeeded fairly well.

Some three miles of aloes have been planted as a hedge with fair success.

A tun plantation has been started in the 6th mile and some 500 tun trees planted. Some 400 of these were obtained from Saharanpur, the remainder have been got by the mali in charge at a cost of one anna per tree exclusive of the labor of planting them.

Financial Results.—There has been no income this year from plantations, but Rs. 850 have been received for grass. The total expenditure incurred was Rs. 1,027.

7.—Sirhind Canal, 3rd Division.

General Remarks.—Owing to the sandy nature of the district, the great heat of May, and want of water, operations on any scale have been deferred until opening of the Canal.

Description of Work.—The only real work done was, to replace a few trees in the avenues and compounds. An attempt at tun broadcast sowing was also made, but with complete failure.

Financial Results.—Expenditure Rs. 728. No receipts.

8.—Sirhind Canal, 4th Division.

General Remarks.—Nothing done during the year. The trees already planted on the Sutlej navigation channel are thriving ; but no new ones have been put in. The rainfall at both Ferozepur and Mogah was below the average.

Financial Results.—Expenditure Rs. 89-4-8. No receipts.

9.—Sirhind Canal, 5th Division.

Blank.

10.—Western Jumna Canal, Karnal Division.

General Remarks.—The year has been an uneventful one.

Description of Work.—More trees were planted out in the Sóm plantation (above Dadúpúr), the Dadupur and Karnal mangoe gardens were kept up ; line trees planted on a portion of rajbaha No. IV ; and some timber was cut down for sale.

On the Dadupur-Kharwan road 24 lime trees were planted out; all flourishing. This avenue is complete, only here and there are there blanks.

On rajbaha No. IV an attempt was made to plant shisham trees along the boundary lines. At the commencement 8 miles of the channel were lined with trees: during the year 16 miles have been added. No casualties are reported.

1,344 trees were planted out in the Sóm plantation above Dadúpúr, most of these trees were shisham. 85 acres of this plantation were planted previous to the commencement of the year under report. Since then 8½ acres more have been planted. In one part seed was sown broadcast, but very little came to anything. The tract of land is open and exposed, suffers considerably from the hot winds. The soil is good in some places, but sandy for the most part. The trees that are planted out appear to flourish well, and no failures have taken place as yet.

In the Dadúpúr station a few ornamental and fruit-trees have been planted out in spare places. Also seedlings have been raised of mangoes for grafting, jack, bamboos, sembal, túm, shisham, bakain and sál. Of 2,000 sál seedlings only 150 remain. Sál propagated from seed at Dadúpúr do not thrive though plants brought from the hills flourish very well. Cuttings were planted of burgat, mulberry and grape. The entire station is covered with trees and plants.

Karnal (new chauki compound). A line of young trees has been planted around the compound.

Trees at Munak near the old canal were lopped.—
Seed was collected for future sowings.—
Certain old trees on the canal near Karnal were cut down for sale.
Repairs to wells and 'charas' were executed.

Establishment and Supervision.—The plantation work is done by malis (generally in constant empoly), assisted by laborers engaged by the day according to the exigencies of the work in hand. There were thus two malis kept throughout 1881-82, one at Rs. 6, and one at Rs. 5 per mensem. The daily pay of laborers is 2½ annas. The supervision is entirely that of the Engineer staff.

Financial Results.—

		Rs.	A.	P.	Rs.	A.	P.
Receipts.							
Sale of wood	...	578	5	3			
Do. fruit	...	947	8	0			
Do. mango grafts	...	10	0	0			
Do. jack plants	...	9	6	0			
					1,545	3	4
Charges.							
Labor	...	907	8	6	907	8	6
		Surplus			... 637	10	10

The principal revenue is by sales of fruit, mostly mangoes.

11.—WESTERN JUMNA CANAL, HANSI DIVISION.

General Remarks.—Nil.

Description of Work.—The mango garden near the inspection house at Butana has been tended as usual, and blanks filled up with Saharanpur imported grafts. The revenue derived from sale of the fruit was Rs. 180.

A few blanks are being filled up on the branches of this canal. There has been some thinning out effected, and the fuel is collected for brick burning. Túm trees appear to flourish well on parts of this canal.

Below Safidon the trenching out process referred to in last year's report has succeeded fairly, but the plants appear very small, although they are a year old. Shisham, kikar, and jaman seed was sown in these places, and when large enough, some will be thinned out for the canal avenue. Similar trenching has succeeded also above Dhatrat, but the available area is confined.

A number of trees die annually, owing to the berms on which they grow being laid under water during the high monsoon supplies. These berms or the space between the canal road or main embankment and the canal itself, are often low, and only protected by a slight bank. The main bank is being raised and strengthened, and these hollows are being silted level with high water mark, so that many trees standing in this space have died. However they will soon be replaced by others which will grow spontaneously. Less wood was sold, as it is expected that the railway will now indent largely for it.

In the Hansi Sub-division the trenching did not succeed at all, as the officer in charge misunderstood orders and sowed his seed in the trench, instead of on the edge or berm; and, immediately after flooded it for so long that the seeds rotted. These trenches are being cleared out and will be sown again. Kikar seed was sown in various spare

places during the rains. An avenue six miles in length on the canal right bank was planted with fair success.

On the Darba branch and Bahadra canal, a number of trees—shisham and mulberry were planted, and many have taken firm root. This region is dry, but the soil very suitable ; and the Bikaneer State is always willing to buy timber and fuel. On indent, shisham to the value of Rs. 800 has been sold to the Rajah.

Establishment and Supervision.—There is no special establishment maintained for the supervision of plantation work, nor is it required.

Financial Results.—The income derived for the year under report was Rs. 4,338, and the expenditure Rs. 2,031.

WESTERN JUMNA CANAL, DELHI DIVISION.

General Remarks.—There is nothing special to report concerning the plantations and trees on the banks of the old canal, Delhi and Rohtak branches, during the year under review. Considerable supplies of timber and fuel have been obtained from the banks, all possible care being taken that young and ornamental trees should not be cut. In places, however, constant indents for fuel have bared considerable lengths of banks; especially is this the case between Rev and Noltha where a large number of trees have been cut for fuel for works; and it would be advisable to replace the trees cut down, by new plants, but, as previously reported planting has had to be abandoned on account of the damage done by monkeys. These monkeys seem to increase every year, and the damage done to young trees and adjoining crops is enormous. The people themselves, though they will not destroy them, would welcome some measures for reducing this number.

On the Rohtak canal 164 young trees were put out during the year, of which 41 are reported to have died. The trees planted in the two previous years numbering 683, were looked after and watered.

An attempt was made to plant kikar trees along the banks of Najafgarh escape, the experiment was only moderately successful. The cattle undoubtedly prevent a great many young trees from coming up, and it is hardly possible to watch so long and out of the way, line. The method followed was to dig two trenches, one on each bank along the boundary line, and in these were planted the seeds of the common kikar. A great many will undoubtedly succeed, but many also will never come to anything. The number successful will be more evident after the rains.

No. VIII *Rajbaha.*—Kikar was sown during the rains on the right bank of the main line of this rajbaha. These are doing well.

No. IX *Rajbaha.*—There were planted on this rajbaha 593 young trees during the year. Of these 32 died from being in reh soil, and 213 were destroyed by cattle. The subdivisional officer reports that the cattle feed along the sides of the rajbaha outside the boundary and pull off every shoot within reach.

No. XII *Rajbaha.*—The portion between Kheri, Damkan and Goliana which was left untouched last year, was this year planted out. The greater part of the work, however, consisted in replacing young trees that had died or been eaten off by cattle or otherwise injured. The line of trees planted out now extends from Goliana to near the head of the rajbaha, but many gaps still occur owing to death of young plants. A portion also of the right bank of the rajbaha was planted out and some hundreds of young mangoe trees were planted in lines.

Two plantations were maintained throughout the year, one at Gangatoli and the other at Sarag Thal. In the former the chief work was the experimental sowing and cultivation of the *Reana Luxurians.* The result was fairly satisfactory as far as the outturn of fodder was concerned. But it has two drawbacks which will prevent its general cultivation by zamindars. Firstly, it occupies ground which might be used for more valuable crops for a very long time viz ; 10 months, and secondly, it requires a great deal of water. Other work done at Gangatoli consisted in thinning out and replanting young trees of tún, shisham, and jaman, and the cultivation of young mangoes from seed. These mangoes will be eventually grafted from the Bombay mangoes, and used to fill up vacant spaces in the mango gardens. At Sarag Thal the main work consisted in carrying on the plantation along the roadway of No. XII rajbaha.

The mango garden at Gangatoli is not in a good state. Many of the young Bombay trees seem to develop dry branches and timber as though the roots had in some way been affected by the soil or by insects. The yield, however, at Chhota Thana and Gangatoli was very much better than the year before.

In the Rohtak garden the attempt to introduce new trees was not at all successful. The place is infested with white ants which destroy the young trees. At Sarag Thal the young trees are very flourishing, and it is hoped that eventually a good mango garden may be established there. The young trees were protected in the usual way during frosty weather by being covered with grass, screens, &c. A good many young trees were also planted out.

The Noltha garden yielded a very poor return. The high winds in May destroyed much of the fruit.

The Sardhána garden is so badly affected by reh as to be almost hopeless.

Establishment and Supervision.—Excepting the malis at nurseries, no special establishment was entertained for this work.

Financial Results.—The following table shows the income from, and expenditure incurred on, plantations during 1881-82.

Receipts.

Plantations—	Rs. A. P.	Rs. A. P.
Sale of fuel	1,397 10 3	
„ of timber	4,162 5 3	
„ of fruit	699 12 9	6,259 12 3
Other Canal produce—		
Sale of grass, lakh and pula &c.	602 3 2	602 3 2
Total receipts for the year ...		6,861 15 5

Expenditure.

	Rs. A. P.	
Sundry charges for maintaining Plantations ...	1,400 10 9	
Total charges for the year ...		1,400 10 9

13.—Western Jumna Canal, New Delhi Branch Division.

General Remarks.—The trees transplanted from the nurseries and put on boundary roads. Some are doing fairly well, a considerable number were however killed by frost. The *Reana Luxurians* have failed chiefly from want of water.

Description of Work.—The transplanting, waterng and maintaining.

Establishment and Supervision.—At present there is no permanent establishment kept up. Labor (daily) is used when necessary. Total expenditure thereon has been Rs. 266 during the year.

Financial Results.—Nil.

14.—Muzaffargarh Canal Division.

No grant has yet been made for plantations.

In December 1881 the Deputy Commissioner requested the Executive Engineer to take over two plantations which properly belonged to the Canals, because the Canal Fund was to be transferred to the D. P. Works. These plantations are :—

1st.—Trees planted out between Kot Ratta embankment and Rattan Canal. This plantation contains 2,269 trees exclusive of 1,434 trees that have dried.

2nd.—Trees planted out in 5th mile of Wali Canal in 1880-81. At the end of 1881-82 there were 1,014 trees alive. Nothing beyond maintenance of these plantations was attempted during the year. The former costs Rs. 30 per month, the latter Rs. 10 per month.

PROGRESS REPORT

OF

DISTRICT, CANAL AND PROVINCIAL ROADS ARBORICULTURE

IN THE

PUNJAB

FOR

1882-83

COMPILED BY

THE CONSERVATOR OF FORESTS

WITH A REVIEW BY HIS HONOR THE LIEUTENANT-GOVERNOR OF THE PUNJAB

Lahore
PRINTED AT THE CENTRAL JAIL PRESS
1883

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Proceedings of the Hon'ble the Lieutenant-Governor in the Forest Department No. 451, dated 24th October 1883.

READ—

Report by Mr. B. Ribbentrop, Conservator of Forests, Punjab, on Arboriculture in the Punjab, during the year 1882-83.

REMARKS.—The Report, which is due to Government upon the 1st of September, was completed by the Conservator of Forests upon that date, but was not received in print until the second of the following month.

This result was caused entirely by the circumstance that the returns of certain Districts and Canal Divisions were again submitted at a very late date. As the report is an extremely simple one, and as the facts of the year's work can be better ascertained immediately at the close of the cold weather than at any other time, there is no valid excuse for tardy submission, and the Lieutenant-Governor trusts that he will not have occasion to notice this shortcoming on subsequent occasions.

2. During the year 1882-83 about a lakh of rupees was spent upon District Arboriculture. The income realized was a little less than one-third of the expenditure, and the net annual charge for the maintenance and production of trees was Rs. 66,716. The different districts exhibit widely different financial results. To some extent this is inevitable. Income will always be comparatively small, and charges high in the arid and infertile tracts of the Province, such as Sirsa, Montgomery and Jhang. But even in those districts which are similarly circumstanced the proportion borne by income to expenditure shows considerable variations, which should be noticed by Commissioners in forwarding the district reports. In the present imperfect development of district arboriculture these variations are no doubt unavoidable, and for some years to come the return for the expenditure must, in many districts, be mainly indirect. The Conservator of Forests thinks that avenues, unless of fruit trees, can never be remunerative, and the Lieutenant-Governor agrees with Mr. Ribbentrop that it is a wasteful and unscientific practice to attempt to secure a large temporary income by means of excessive lopping. What is really required is that the district officer should see that the resources placed at his disposal are utilized to the utmost possible advantage, and that no legitimate source of income is neglected. There is no reason why in due time district arboriculture should not become not only self-supporting but remunerative.

3. The Lieutenant-Governor does not propose to enter on a lengthy examination of the report in this Review. The report is an excellent one, and full of most useful suggestions, which deserve the careful consideration of all Local officers and Local bodies. His Honor shares the hope of the Conservator that the development of the policy of local self-government will add a special impetus to arboriculture.

If the matter is taken up vigorously, much may be done to induce the people themselves, and especially the wealthier land owners, to plant groves of trees. His Honor will be glad if the Conservator of Forests will prepare, and submit through the Financial Commissioner, a draft Circular to all Commissioners and Deputy Commissioners embodying the suggestions which have been made from time to time with the object of fostering arboriculture by the people. When issuing the Circular, the Conservator should seek the opinion of local officers as to the measures which would be most likely to attain the object in view, and after considering the opinion received, he should submit a brief report with his own views to the Local Government through the Financial Commissioner. If groves of fruit trees, and trees suitable for fodder, were widely planted over the more arid districts of the Province round wells, and

tanks, and natural depressions where water lies, they would add materially to the wealth and welfare of these tracts, especially in seasons of drought. That the people are not altogether indifferent to these advantages is proved by many facts in the present report; and if nurseries were established at convenient places in every tahsíl, and young trees of the kinds bearing fruit or producing fodder were distributed at the expense of the district fund, the people would probably be glad to take them and raise groves wherever opportunities offer. A distribution of prizes for the best groves, as suggested by Mr. Maconachie, and the grant of small khillats and certificates on public occasions to those who exert themselves in the cause of arboriculture would doubtless have a good effect on individuals; and in the case of villages much may be effected through the influence of the Zaildárs and leading men, and by petty concessions made at the time of settlement.

4. It is satisfactory to observe that many district officers take a special interest in arboriculture. The pains bestowed on the subject by Colonel Grey, Colonel Harcourt, Colonel Lang, Mr. Wakefield, Mr. Roe, Major Bartholomew, Mr. Fryer and others, will be productive of excellent results after some years. Deputy Commissioners should consult the Conservator of Forests in all matters connected with arboriculture in which they may require advice and assistance; and when the proposed scheme for drawing District and Forest Officers into closer relation is carried out, the latter will in many districts be able to give advice on the spot regarding arboricultural operations.

The success which is attending the efforts of the Deputy Commissioner of Hoshiárpur to protect the city and its surroundings from the action of "chhos" by planting trees, bushes and grasses is satisfactory. The attention of the Conservator and of the Deputy Commissioner has been recently invited to the results of experiments made at Saháranpur with various plants and trees which are used in Australia and Africa to check the spread of sand, and which Mr. Duthie considers suitable for adoption in the Punjab.

5. The Form proposed in the 18th paragraph of the Report for the exhibition of the financial results of district arboriculture is a good one, and should be used in future by all Deputy Commissioners. The suggestions made in paragraph 17 should also be carefully attended to, and the form of Progress Statement there indicated should be adopted. The Conservator will no doubt be able to arrange with the Superintendent of the Government Press for the distribution of printed copies of this form to all district officers.

6. The Table given in paragraph 23 of the Report gives much useful information in a compendious form. The Lieutenant-Governor would be glad if the Conservator would arrange to have it completed by the inclusion on the same plan of the species referred to in paragraph 22. It might then be separately printed and circulated as a brief abstract guide for district arboriculture. If necessary, it might also be translated for the benefit of Tahsíldárs and Local bodies. Its utility would, the Lieutenant-Governor considers, be increased if the proper time for sowing were invariably indicated either in column 3 or in column 4. At present this appears not to have been done in some instances.

7. The attention of the Joint-Secretary to Government, in the Irrigation Department, will be drawn to the Conservator's remarks in paragraph 28 and in the last two sections of paragraph 29, and the Secretary to Government, in the General Branch of the Public Works Department, will be asked to issue the instructions necessary to secure the submission of more satisfactory reports from his Department than those described by Mr. Ribbentrop in paragraph 33.

8. On the whole—in spite of various shortcomings—the operations of the year exhibit results which may be considered satisfactory. The Report submitted by the Conservator is suggestive and practical, and the thanks of the Lieute-

nant-Governor are due to Mr. Ribbentrop for the pains which he has bestowed upon it.

ORDER.—Ordered that the above Review be published, and circulated with the Report as usual; also that copies, with copies of the usual number of reports, be forwarded to the Government of India, in the Department of Revenue and Agriculture; also that it be published in the *Punjab Government Gazette.*

By order of the Hon'ble the Lieutenant-Governor,

H. C. FANSHAWE,

Offg. Junior Secretary to Government, Punjab.

Punjab Government Secretariat Press, Lahore.—29-10-83.—24-243.

C. L. No. 404, dated Kilba, 1st September 1883.

From—BERTH RIBBENTROP, ESQ., Conservator of Forests, Punjab,

To—The Junior Secretary to Government, Punjab.

I have the honor to submit Progress Report on District and Canal Arboriculture for the year 1882-83. My report is due to Government to-day, but the last district reports were only received by me two days ago, on my march from the Teedong Valley to Kilba, instead of on the 1st of July, and it was therefore impossible for me to take work in hand at an earlier date. No report has been received from the Simla District.

2. The reports embrace as yet only the planting of avenues, groves, nurseries, and station gardens; but I hope to see this scope gradually extended to the management of waste-lands under the direct control of the District Officers, and ultimately to that of forest lands belonging to communities and private persons; and I trust that this will be one of the results of making the Forest Officers Assistants to the Deputy Commissioners of the districts.

3. In many of the reports which I have the pleasure to submit it is recognized that the duty of Government as regards district arboriculture extends further than the planting of avenues and groves on district roads and round cantonments and civil stations. The Deputy Commissioner of Gurgaon notices the clearing of waste-lands by charcoal-burners, and recommends the introduction of conservancy and reproductive measures by voluntary efforts of the people. The bare ranges of that district are proved to be *primâ facie* forest land by the luxurious growth of kíkar, karíl and dhak in sacred groves. The Deputy Commissioner, Amritsar, also acknowledges the necessity of extending arboriculture beyond roadside planting; and the Deputy Commissioner, Ludhiána, proposes that Government as landlord should, by legislation, take a more active part in the direction of arboricultural operations to be carried out by their permanent tenants, and that the opportunity of each new settlement should be seized to introduce improvements. Mr. Wakefield points out how this can be done by simple arrangements with the proprietors, and entries in the Wájib-ul-Arz. These proposals deserve special consideration, as well as Mr. Maconachie's rules, which were adopted by the Delhi District Committee and by which rewards are offered for the best cultivated and fenced area. The only real progress, however, is reported in the Rawalpindi Division, where some 65 acres of land were sown with sissú, mulberry and kíkar, and where some 476 trees were transplanted by the lambardárs of 214 villages. The results of this operation are not noted.

4. The Punjab is, in spite of the vast improvements which have taken place in this respect since British occupation, still eminently poor in arbori-vegetation; both timber and firewood are more expensive than in many countries where the labourers' wages are five times as high, and fields and gardens are still robbed of manure to feed the hearth. Much has been done, especially by

Government, but more remains to be done, and arboriculture, as a private enterprize and future source of wealth, must be encouraged.

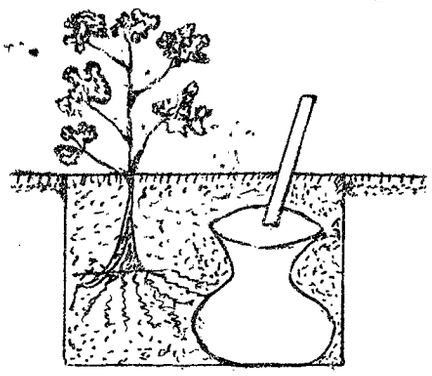
Great hope is entertained that the development of the policy of Local Self-Government will add an impetus to arboricultural operations, a hope which will be realized if historical examples in other countries can be trusted; but I would nevertheless point out the advisability of encouraging arboriculture by communities and private persons, by means of some direct or indirect advantages whenever the opportunity offers, by non-assessment of forests during the terms of a settlement, or by assessment of lands which ought to be forest but are useless waste, or worse—a danger to the surrounding country, like the Chos at Hoshiárpur. I doubt that without legislation, or special arrangements during settlement ensuring immediate advantages, a great impulse can be given to private arboriculture on a large scale, as arboriculture entails immediate and annually recurring sacrifices, and only opens prospects to a comparatively far-off gain. In several instances, moreover, Government claims the proprietory right over certain classes of trees growing on land belonging to private persons, and, till this is settled by a division of the property or otherwise, arboriculture cannot possibly thrive in such localities.

5. Whilst little can thus be recorded regarding the development of general arboriculture by private persons, the reports teem with the extension of private orchards and the planting of fruit-trees round wells and villages; and the efforts made in that direction by most District Officers, and the annual distribution of many thousands of plants, are of great importance to the country, and must largely influence the happiness and comfort of the people, especially in barren districts like Shahpur and Jhang, the date-palm cultivation in which latter district deserves special notice. I would strongly recommend that wherever district arboriculture is sufficiently systematized on the principle recommended by Colonel Harcourt, which I shall note hereafter, all tahsíl gardens should have a fruit tree nursery attached to them, whence young plants should be given away or sold as the case may be. Rich and influential natives, headmen of villages, and others should also be encouraged to plant fruit-trees in their gardens, to establish small nurseries, and to distribute plants to their less fortunate neighbours. The demand for fruit-trees has apparently been awakened throughout the Punjab; the zamíndárs see the advantage they derive from their culture, and are willing to take care of them, and there should be no lack in the supply of plants.

6. The District reports are printed in the customary sequence, but for a generalization of arboricultural operations in the Province it will be preferable to classify the several districts as "Arid," "Very dry," "Dry," and "Forest districts." Class 1 contains Sirsa, Shahpur, Mooltan, Jhang, Montgomery, Muzaffargarh, Dera Ismail Khan, Dera Gházi Khan and Bannu. The very dry districts comprise Hissar, Kohát, Pesháwar, Ferozepore, Karnál, Rohtak and the southern part of Lahore. Amongst the dry ones may be reckoned north Lahore, Ludhiána, Jullundur, Amritsar, Gujránwála, Delhi, Gurgaon and

Jhelum; and Forest districts are Siálkot, Gurdáspur, Gujrat, Hoshiárpur, Rawalpindi, Hazára, Umballa, Kángra and Simla. Of course, the district boundaries do not run in exact accordance with my classification, and I am otherwise open to correction; but I have no better at present. At some future time I hope to accompany my report by an arboriculture map, noting not only average rainfall, but also depth of water below the surface, extent and depth of *kankar* beds, and areas influenced by *kallar* and *shorá;* for these four phenomena are those which mainly influence arboriculture in this country.

7. In the arid districts, avenue trees can, under existing circumstances, only be grown if a sufficient water-supply is conveyed to the roots, either by artificial irrigation or percolation. Where the moisture is not more than 25 feet below the surface, kíkar and farásh may still exist; but where the level of moisture is still lower, only a few children of the desert—jhand, phulái, rerú and karíl—can thrive, which send their roots 60 feet and more below ground in search of water. The natural reproduction of these trees in arid districts is by no means cleared up, and is, I believe, a question of rare and fortunate accident. Their cultivation by means of irrigation is not difficult, and after some years of watering these hardy species establish themselves; for avenues or groves they are, however, of little use. That other trees require a constant watering is exemplified in the report of the Jhang Deputy Commissioner. Trees twenty to thirty years old growing in the compound of the District Superintendent of Police died when the bungalow was abandoned and the well ceased to work. Wherever, therefore, ornamental and shady trees cannot be grown without artificial irrigation, and where water-channels cannot be run along the roadsides, all efforts should be concentrated to grow groves near wells and tanks; and under such circumstances I would, in the first instance, recommend that only the most shady, valuable and fruit-bearing trees, such as mangoes, be planted; secondly, that any underlying *kankar* or clay bed be broken through, and that only sub-soil irrigation by means of *gharras* be used: such irrigation is cheaper, and makes it feasible to grow trees in worse, even in salty, soil.



To effect sub-soil irrigation, an empty porous *gharra* should be buried, alongside the place where the tree is to be planted, some 2 to 3 feet below the ground, and only a bamboo tile should be inserted in the mouth of the *gharra*, which must otherwise be tightly closed. The *gharra* need only be filled twice a month in the hottest weather, and a single bhistí may thus supply groves of mangoes or other fruit-trees of several acres in extent.

8. The successes noted in the reports of the Shahpur and Jhang Districts, as regards planting operations near wells, or land where moisture is near the surface, are very encouraging; much has also been done in the Dera Gházi Khan, Dera Ismail Khan and Bannu Districts in the cultivation of avenues on irrigated

land; but the Commissioner, Derajat, thinks, and rightly so, that complete avenues could and should be established everywhere in reach of canal-water. In Dera Gházi Khan marked progress has been made with an irrigated sissú plantation, and guinea grass has been evidently successfully introduced therein. The percentage of successful planting in the Dera Ismail Khan and Dera Gházi Khan Districts is pleasingly high. The Muzaffargarh District has in many parts great advantages over the other arid districts, the water lying comparatively near the surface; but during the year much has been attempted, and the success has been small, probably because the attempts were too ambitious and beyond careful supervision. The operations in the Mooltan and Montgomery Districts have, outside a few civil stations, been always somewhat spasmodic and uncertain, and I strongly advise that in future they be concentrated on valuable groves, as above indicated, near tahsíls, railway stations, serais, and roadside wells and tanks. The rainfall in Sirsa, Jhang and Bannu has been below the average, but has exceeded it in all other of the arid districts.

9. In the very dry districts the more valuable trees will mostly demand several years' irrigation before they establish themselves in favorable places; and in heavy bár soil, where the water is a long way from the surface, permanent irrigation will mostly be required, and I would again recommend sub-soil irrigation. In the south-east of the Province, kíkar can, in favorable localities, be established with comparatively little watering, even in the very dry districts; but in the northern districts it is very liable to be killed by frost, more especially in hollows and depressions of the ground.

10. The rainfall in Hissar and Karnál during the year under review was below the average, in Kohát slightly above, and in Ferozepore an exceptionally heavy rainfall is recorded. No data have been given for Pesháwar and Rohtak.

The greatest progress is recorded in Ferozepore and Pesháwar, with a fair percentage of success. In Rohtak and Hissar, though the number of trees put out is much smaller, the percentage of success is satisfactory. In Kohát only a few hundred trees were put out, but a fair number succeeded, whereas in Karnál only 529 trees took root out of a total of 2,580 planted.

11. In the dry districts (class 3) it will be found that most indigenous trees can, in all but particularly unfavorable localities, be established with two or three years' watering, and on good rich soil often with less. In these districts it is altogether a question of locality and calculation whether sub-soil irrigation or superficial watering should be used. In the eastern third class districts, kíkar will in favorable years succeed without irrigation; and in the north-western ones on slopes and embankments where it is not exposed to stagnant night air and frost. As regards the cultivation of kíkar, phulái, &c., without irrigation on areas where rainfall is scanty and varying, I would draw attention to "Hints on Arboriculture," page 12. The method there described has been much developed in the Punjab of late years, and with considerable success. The trenches are in exact contour lines to the slopes, the distance being 6 feet apart,

a greater distance courting erosion; the seed is sown both in the trench and on the prepared ridge. All water falling between the trenches is collected within them, and penetrates the soil. In years with scanty rainfall the seed sown in the trenches germinates, and that on the ridges dries up. When the rains are copious, the young plants in the trenches are probably drowned, but those on the ridges will succeed, or it may happen that both come up.

12. During the year under review, Lahore, Gujránwála, Gurgaon and Jhelum enjoyed a rainfall in excess of the average; in the other dry districts a rainfall short of it was recorded. In most of the third class districts several thousands of trees have been planted in avenues and groves—in Gurgaon alone above 24,000—and the percentage of success recorded is fair, but not so satisfactory as ought to be attained in these districts if that care had been bestowed which an avenue tree requires. In Delhi kíkar seed was sown in trenches with partial success. This method of cultivation, however, is cheap, and should be continued. The information of work done during the year at Amritsar is meagre. Under length of road planted during the year, 2,947 is entered, which, as it cannot be miles, I have accepted as number of trees.

13. Arboriculture in the *bonâ-fide* Forest districts of the Punjab is, where soil, sub-soil or other local condition is not exactly unfavorable, comparatively simple, and watering through one hot season will mostly be sufficient to establish any indigenous tree, and in many of the more favorable localities no watering is required at all; however, in the case of avenue trees, on which under any circumstances a considerable amount of care and money must be expended, it is better to err on the right side and not to risk the result on account of a little extra expenditure.

14. All districts underlying the Himalayas east of the Jhelum show, during the year under review, a rainfall much below the average; but the difference gradually decreases from east to west, and in the districts of Rawalpindi and Hazára a surplus rainfall is recorded. One of the "Forest districts" gives, in the statement appended to the report, the average annual rainfall of somewhat less than 2 inches, which necessitates reference to the *Punjab Gazette* and other records of rainfall. In Hoshiárpur 16,769 trees were planted, with a success of 92 per cent.; in Kángra 47,379 plants were put, of which 30,794 are said to have taken root. A personal inspection of the avenue plantations between Rillu and Baijnáth, and of those in the Kulu valley, did not impress me favorably. Soil and climate are specially adapted for arboriculture, and a little more care in planting and protection and a little less hurry would be amply repaid. Umballa also shows a large percentage of failures for which no explanation is given. The records of work done at Siálkot are satisfactory, as well as those of Rawalpindi if the special difficulties of this district are taken into consideration. The progress in Hazára seems hardly in keeping with the necessities of the case, as Colonel Batchelor informed me that for some years past the surrounding hills are grubbed for firewood

for Abbott-abad. The Gujrat report contains no detail, but is generally favorable; nor does the Deputy Commissioner, Gurdáspur, give the number of trees planted and the percentage of success, but, to judge from Colonel Harcourt's action and report, district arboriculture in the Gurdáspur District is in very safe hands. The planting of múnj grass, as a protection against the sand waves carried down from the Chos, has already been noticed in the special report on that subject.

15. The following table shows, as far as I could compile it, the number of trees planted during the year in avenues and groves, and the percentage of success reported :—

Serial No.	DISTRICT	*Roads and avenues during* 1882-83			*Groves during* 1882-83		
		Planted number of trees	Successful number of trees	Percentage of success	Planted number of trees	Successful number of trees	Percentage of success
	I.—ARID.						
1	Sirsa	120	76	63	1,434	958	67
2	Shahpur	32,179	20,354	63	...	...	...
3	Mooltan	5,239	2,978	56	...	...	...
4	Jhang	1,715	...	...	...	...	...
5	Montgomery	2,199	...	...	...	...	...
6	Muzaffargarh	19,064	5,487	29	51,941	51,721	99
7	Dera Ismail Khan	13,321	12,432	93	...	...	...
8	Dera Gházi Khan	8,025	...	...	...	...	...
9	Bannu	2,295	1,127	49	...	...	...
	II.—VERY DRY.						
10	Hissar	4,450	3,010	67	200	180	90
11	Kohát	472	...	...	114	...	...
12	Pesháwar	19,466	15,948	82	...	...	...
13	Ferozepore	34,809	26,883	77	19,263	14,872	77
14	Karnál	2,580	529	20	...	...	...
15	Rohtak	1,789	1,734	97	...	...	...
	III.—DRY.						
16	Lahore	5,455	4,287	78	...	...	...
17	Ludhiána	3,696	...	...	...	...	...
18	Jullundur	7,668	6,900	90	...	...	...
19	Amritsar	2,947	...	...	...	...	...
20	Gujránwála	522	397	76	...	...	...
21	Delhi	1,050	955	90	...	...	...
22	Gurgaon	24,163	15,509	64	...	...	...
23	Jhelum	2,735	2,433	83	13,126	12,420	95
	IV.—FOREST DISTRICTS.						
24	Siálkot	28,458	24,411	86	...	...	...
25	Gurdáspur	...	...	...	...	...	...
26	Gujrat	...	...	...	...	...	...
27	Hoshiárpur	16,769	15,404	92	201	184	92
28	Rawalpindi	19,779	12,023	61	...	...	...
29	Hazára	1,441	...	...	3,357	...	...
30	Umballa	3,839	2,095	54	...	...	...
31	Kángra	47,379	30,794	65	...	...	...
32	Simla	...	...	...	...	...	...
	TOTAL ...	313,624	215,766	73·94	89,636	80,335	93·23

Inclusive of unrecorded operations. It may therefore be accepted that in round numbers 300,000 trees were successfully planted out during the year into avenues and groves.

16. The correctness of the following statement pretending to be an abstract of the work done in each district is as yet problematical, as the instructions issued in paragraph 7 of the last Government review had apparently not been understood by many District Officers :—

Districts	*Roads and avenues*					To be planted	Total area of roads	*Groves planted*		
	Planted in previous years	Fully planted	Half planted	Planted during 1882-83	Total			In former year	During 1882-83	Total
	M.	M.	M.	M.	M.	M.	M.	A.	A.	A.
Sirsa	94½	...	...	...	94½	38½	133	155	...	155
Shahpur	6¼	...	..	53½	59¾	16⅛	75⅞	13	44	57
Mooltan	119¾	...	...	3¼	123	373¼	496¼	3	1	4
Jhang	44½	...	...	...	44½	206	250½	373	...	373
Montgomery	12	...	...	2	14	67	81	30	1	31
Muzaffargarh	68$\frac{35}{36}$	...	...	22¼	91$\frac{4}{18}$	277$\frac{5}{18}$	368½	85	28	113
Dera Ismail Khan	42	...	...	6	48	190	238	11	...	11
Dera Gházi Khan	64	...	...	7¾	71¾	225½	297	30	30	60
Bannu	41	...	...	...	41	67	108	11	...	11
Hissar	75¼	...	...	¾	76	161	237	50	...	50
Kohát	2	...	...	⅛	2⅛	...	2⅛	8	1	9
Peshawar	126½	...	...	14½	141	89	230	...	...	...
Ferozepore	425	...	...	17½	442½	96½	539	328	12	340
Karnál	50¾	...	...	8⅝	59⅜	176	235⅜	...	...	...
Rohtak	97½	...	...	7⅔	105⅙	160$\frac{1}{12}$	265¼	104	...	104
Lahore	64	...	...	8	72	204½	276½	...	...	...
Ludhiána	80	...	...	...	80	3	83	12	...	12
Jullundur	140½	...	...	6	146½	236	382½	...	...	...
Amritsar	115½	...	...	...	115½	113½	229	...	...	...
Gujránwála	105½	...	...	1	106½	155	261½	4	1	5
Delhi	...	24	89	...	113	93	206	300	...	300
Gurgaon	...	208½	89	...	297½	204	501½	22	...	22
Jhelum	98⅛	...	...	22⅛	120¼	32	152¼	3	...	3
Siálkot	395	...	...	3	398	43	441	29	2	31
Gurdáspur	375$\frac{15}{16}$	...	...	1	376$\frac{15}{16}$	9	385$\frac{15}{16}$	73	...	73
Gujrat	30	...	...	40	70	...	70	...	...	...
Hoshiárpur	263½	...	...	13¼	276¾	161⅛	438⅜	364	35	399
Rawalpindi	535	...	...	2	537	258⅛	795⅛	...	...	...
Hazára	14¼	...	...	1	15¼	2½	17¾	94	2	96
Umballa	159½	...	...	¼	159¾	19¾	179½	...	...	...
Kángra	341	...	...	50½	391½	238¾	630¼	...	...	...
Simla	...	...	...	...	...	...	...	...	...	...
TOTAL ...	3,987$\frac{113}{144}$	232½	178	291$\frac{19}{24}$	4,690$\frac{11}{144}$	3,916$\frac{106}{144}$	8,606$\frac{39}{48}$	2,102	157	2,259

Accepting the information gathered from the various reports to be correct, the increase in the length of avenues planted during the year would amount to $291\frac{19}{24}$ miles, but I would point out amongst others that Jhelum, whilst reporting the successful planting of 2,433 trees only, records an extension of $22\frac{1}{8}$ miles of avenue, which, even at 30 feet planting distance, would necessitate 8,230 trees. The increase in the acreage of groves is 157 acres during the year under review.

17. What is required is a correct opening balance, which can now only be attained by a careful inspection of the roads and by actual measurement of the length of avenues stocked with trees or well-established plants, and, when this has been authoritatively ascertained, I would advise that the following table should be carefully kept up.

Progress statement of avenues in the _____ District

The total length of roads in the district is _____ miles

Of canals _____ miles

I		II	III	IV	V	VI	VII	VIII
Road or canal on which avenues have been planted or are in course of construction		Length of single lines stocked with trees or established plants at the beginning of the year	Length of single lines planted during the year	Length of single lines on which cultivation has failed or on which trees or established plants have been destroyed or felled	Length of single lines stocked with trees or established plants at the end of the year	Species of trees cultivated	Rainfall	Remarks
Name of	*Total length in feet*	*Feet*	*Feet*	*Feet*	*Feet*		*Average during the year*	

I have submitted instructions for the preparation of this return in my 33 J. L., dated 14th June 1883, and would request that printed sheets should be distributed to be filled up for next year's arboriculture reports so as to ensure uniformity.

A similar annual report should be submitted as regards groves in acres. These statements will, at a glance, elucidate the progress in the branches of district arboriculture.

Groves and nurseries should be strictly separated in all future returns.

18. The following is a statement of financial results of the year's transactions :—

Serial No.	Name of District	Income			Expenditure			Surplus			Deficit		
		Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
1	Sirsa	255	7	9	650	2	9	...	...	...	394	11	0
2	Shahpur	614	0	0	3,734	0	0	...	...	...	3,120	0	0
3	Mooltan	131	0	0	5,363	0	0	...	...	...	5,232	0	0
4	Jhang	285	3	2	5,000	0	0	...	...	...	4,714	12	10
5	Montgomery	...	...	...	1,527	0	0	...	...	...	1,527	0	
6	Muzaffargarh	...	...	...	...	...	...	...	...	...	...	...	...
7	Dera Ismail Khan	...	...	...	2,130	0	0	...	...	...	2,130	0	0
8	Dera Gházi Khan	...	...	...	7,054	0	0	...	...	...	7,054	0	0
9	Bannu	25	0	0	1,165	9	11	...	...	...	1,140	9	11
10	Hissar	398	0	0	4,000	0	0	...	...	...	3,602	0	0
11	Kohát	...	...	...	326	10	6	...	...	...	326	10	6
12	Peshâwar	253	10	6	3,786	7	10	...	...	...	3,532	13	4
13	Ferozepore	...	...	...	...	...	...	...	...	...	...	...	...
14	Karnál	130	0	0	5,755	0	0	...	...	...	5,625	0	0
15	Rohtak	230	0	0	5,295	0	0	...	...	...	5,065	0	0
16	Lahore	515	4	6	2,398	0	3	...	...	...	1,882	11	9
17	Ludhiána	2,175	0	0	4,000	0	0	...	...	...	1,825	0	0
18	Jullundur	4,281	0	0	3,069	0	0	1,212	0	0	...	...	...
19	Amritsar	...	...	...	...	...	...	...	...	...	...	...	...
20	Gujránwála	515	0	0	3,498	0	0	...	...	...	2,983	0	0
21	Delhi District Fund	904	10	0	2,207	12	10	...	...	...	1,303	2	10
	„ Municipal „	3,443	12	6	4,161	5	1	...	...	...	717	8	7
22	Gurgaon	719	2	3	4,562	2	3	...	...	...	3,843	0	0
23	Jhelum	3,606	0	0	5,501	0	0	...	...	...	1,895	0	0
24	Siálkot	2,592	0	0	3,201	0	0	...	...	...	609	0	0
25	Gurdáspur	29	8	0	5,524	0	0	...	...	...	5,494	8	0
26	Gujrat	...	...	...	1,301	0	0	...	...	...	1,301	0	0
27	Hoshiárpur	7,714	0	0	6,004	0	0	1,710	0	0	...	...	...
28	Rawalpindi	110	0	0	516	0	0	...	...	...	406	0	0
29	Hazára	1,834	0	0	2,941	0	0	...	...	...	1,107	0	0
30	Umballa	1,807	1	3	2,438	1	0	...	...	...	630	15	9
31	Kángra	296	0	0	2,472	0	0	...	...	...	2,176	0	0
32	Simla	...	...	...	...	...	...	...	...	...	...	...	...
	TOTAL Rs. ...	32,864	11	11	99,581	4	6	...	...	...	66,716	8	0

The Deputy Commissioners of the Amritsar, Ferozepore and Muzaffargarh Districts gave no financial results : the deficit in all other districts amounts to Rs. 66,716. Jullundur and Hoshiárpur are again the only districts which show a surplus

derived from the sale of wood and grass along roadsides. As long as the present system is adhered to, of planting only ornamental and shady trees as avenue trees, a large income from wood cannot be expected, and is even to be deprecated. The trees are originally planted at avenue distances and no thinning takes place, and the only wood for sale is therefore derived from dying trees and loppings; and the art of lopping consists, to a great extent, in lopping sufficiently early before the branches which have to be removed have formed much wood, or to train the tree with the loss of the smallest possible amount of vital energy. A large income from loppings is therefore by no means a criterion of good avenue management; it will probably be followed by a large income from dying trees; but also by an everlasting high expenditure on account of repair. The only possibility of making avenues remunerative is by the planting of fruit-trees, the crops of which can legitimately be sold annually to contractors.

The financial results, as at present reported by most District Officers, do not sufficiently detail the expenditure, and I would venture to suggest that both expenditure and income be classified under the following headings, both as regards A. Working Charges, and B. Establishments.

Income

	Wood			Fruit	Plants	Grass	Miscellaneous	Total
	Lopping	Thinning	Dead trees					
I.—Ornamental gardens								
II.—Nurseries ...								
III.—Avenues and groves								
IV.—Afforested wastes...								

Expenditure

	A. Working	B. Establishment	Total
I.—Ornamental gardens			
II.—Nurseries ...			
III.—Maintenance and repairs of established avenues and groves ...			
IV.—Extension of avenues and groves ...			
V.—Afforestation of waste land ...			

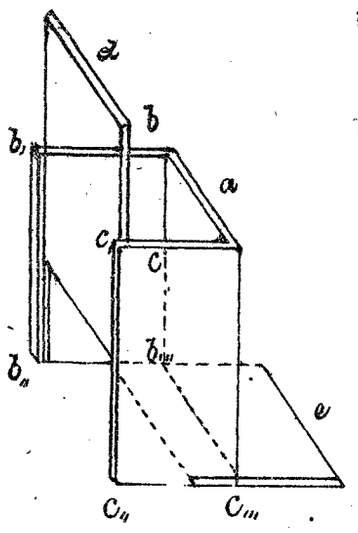
19. The methods of cultivation adopted in most of the districts are the raising of nursery plants, and the ultimate transplanting in avenues and groves where the trees are watered by bhistís or pakháls. This is the best and most approved way of raising avenues and groves, but at the same time the most expensive: and where kíkar and phulái hedges, which will ultimately grow into valuable timber trees, suffice, the sowing of kíkar and phulái in trenches and on ridges is to be recommended. The method employed being undoubtedly correct, any want of success in the first establishing of the plants must be attributed to either unforeseen accidents or want of care.

A carefulstudy of "Hints on Arboriculture in the Punjab," pages 14 to 51, will teach almost all that is required to ensure successful cultural operation if really attended to. I beg to add to my "Hints," which I have carefully re-read, and

which I consider do not require any alteration, though they might be improved by additions, a few remarks, mainly applicable to the planting of avenue and grove trees.

I need not repeat my remarks on sub-soil watering, which has already been explained. Nursery-grown plants are always preferable to naturally grown ones, a large number of which I have seen put out during the year under review, and schooled plants are better than those directly transplanted from sowing nurseries ("Hints," pages 37 to 39).

As a rule, avenue plants should not be put out before they are 3 to 5 feet high, but, where planting cars exist, plants 8 or 10 or 12 feet high can be transferred without much additional difficulty. A word about the transport of avenue plants may be acceptable. I take it for granted that a good school nursery exists in which the saplings are planted somewhat regular and equi-distant; a ditch is cut in front of the first line of trees 2½ feet deep, with a perpendicular face towards the plants, then the earth is dug away round the plants in a very careful way so as to allow the introduction of three sides of a box *a b c* 18″ × 18″ × 30″, or bigger as the case may be. This box has very pronounced groves at b_I—b_{II} and c_I—c, and b_{II}—b_{III} and c_{II}—c_{III} in which strong sharp iron spade blades, *d* and *e*, slide. As soon as the three sides of the box *a b c* have been brought into position so that the main root of the tree forms the centre of the box, the plant is slightly bent and spade *d* is driven home, then spade blade *e*, and the box, with the plant potted in it, is put on a cart, and is only taken to pieces again when the plant stands in the hole which is to be its permanent home. When the boards have been removed, the plant is fixed with manure and loose earth, and will be not much the worse for its transfer. In a simple wooden frame a common country cart will on a good road carry 8 plants weighing a little above one ton.



Considering the expense of avenue planting and the unsightliness of a scraggy avenue, great attention should be given to the sub-soil; where *kankar* and clay beds are less than 6 feet below the surface, they should be broken through, and where the decomposition of clay has formed salts, the soil should be replaced by a mixture of sand and manure.

I beg to draw special attention to the covering of the ground round the roots of the trees described in page 74 of my "Hints." Considerable success has lately been obtained by these means in the cultivation of the South Russian steppes, where the ground has been covered with grass, straw and brambles to a distance of several feet from the stem and to a depth of 9 inches.

20. The manner of the treatment of nurseries and trees schools has been sufficiently described in my "Hints," but I beg here to draw attention to

Colonel Harcourt's report, and would strongly advise that the measures recommended therein be more generally adopted. Wherever feasible, each tahsíl should have a nursery and garden attached to it. These nurseries should be centres of district arboriculture, not only providing material for the planting of roads, but they should also, as mentioned before, distribute fruit-trees and grafts to the zamíndárs throughout the tahsíl. Grafting, budding and marcottage ("Hints," pages 43 to 46) are not difficult to learn, and I think each favorably situated tahsíl garden should be able to supply several thousand grafted fruit saplings 5 to 6 feet high at a cost of from 2 to 4 annas each, and, once fairly introduced, zamíndárs will soon begin to graft their own trees. The first step towards this plan is that a considerable number of highly cultivated fruit-trees be planted at each tahsíl, so as to ensure a supply of grafts and buds.

21. The following is a list of trees reported as cultivated in the different districts :—

Name of District	Species of trees planted
Sirsa ...	Kíkar, pípal, nim, beri and shísham.
Shahpur ...	Kíkar, pípal, mango, jáman, tút, sharín and shísham.
Mooltan ...	Phulái, farásh, bohar, pípal, mango, jáman, bakáín, nim, ber, mulberry, tún, siris, sissú, *eucalyptus* of various sorts, gul-jangi, grape, pomegranate, peach, orange and gondi.
Jhang ...	Jhand, phulái, kíkar, pípal, mango, willow, ber, tút, siris, shísham, barna, ambaltás, date trees, gulnister red, banyan, bédmusk, álúchá, vine, fig-tree, apple, *eucalyptus*, pomegranate, apricot, peach, palm, damson, simbal, orange.
Montgomery ...	Farásh, kíkar, pípal, bakáín, ber, mulberry, siris, shísham, lasúrá, orange, peach, álúchá, khattá and mitthá.
Muzaffargarh ...	Kíkar, bohar, pípal, mango, ber, mulberry, siris, shísham and lasúrá.
Dera Ismail Khan ...	Kíkar, ber, sarín, shísham, tamarisk and "bhani."
Dera Gházi Khan ...	Kíkar, mango, jáman, siris, shísham, *eucalyptus* and pomegranate.
Bannu ...	Willow, ber, mulberry, shísham, darek, date and khagal.
Hissar ...	Kíkar, pípal, mango, bakáín, beri, mulberry, shetút, tún, siris, shísham, gular, jál, sheswa, kaindu, gondi, orange and pomegranate.
Kohát ...	Mulberry, siris, shísham, *eucalyptus*, bar and kulujar.
Pesháwar ...	Shísham and ghás.
Ferozepore ...	Farásh, kíkar, mango, beri, tút and shísham.
Karnál ...	Pípal, mango, nim, siris, shísham, jamowah, tút.
Rohtak ...	Farásh, kíkar, pípal, mango, bakáín, nim, mulberry, tún, siris, shísham, gular and kachnál.
Lahore ...	Farásh, kíkar, pípal, jáman, tút, siris and shísham.
Ludhiána ...	Bor, pípal, mango, jáman and shísham.
Jullundur ...	Mango, jáman, mulberry, siris and shísham.
Amritsar ...	Pípal, mango, jáman, nim, mulberry, siris and shísham.
Gujránwála ...	Mango, siris, shísham and orange.
Delhi ...	Jhand, farásh, kíkar, pípal, mango, jáman, bakáín, nim, willow, beri, mulberry, tún, siris, shísham, gular, pomegranate, khattá, barna and tamarind.
Gurgaon ...	Kikar, pípal, jáman, nim, siris, shísham, gular, lasúrá, *millingtonia*.

Name of District	Species of trees planted
Jhelum ...	Kíkar, mulberry, sissú, tallow, dharek.
Siálkot ...	Phuláí, kíkar, pípal, mango, ním, beri, mulberry, tún, siris, shísham, bahera, amaltás, *eucalyptus*, lasúrá, dharek, *terminalia*, *cassia fistula*, tamarind and plum.
Gurdáspur ...	Kíkar, mango, jáman, willow, mulberry, siris, shísham, dharek, álúchá, árú, ámrúd, khattá, sukhchain, bamboo, mitthá, galgol, orange and anár.
Gujrat ...	Kíkar, ber, tút, siris and shísham.
Hoshiárpur ...	Mango, jáman, tún, shísham, bamboo and pilkan.
Rawalpindi ...	Phuláí, kíkar, mango, beri, tút, tún, shísham and dharek.
Hazára ...	Willow, tút, sofaidá, tálí, akhrót, chír, drawa, dharek, amlok, phugwárí, árú, roses, álúchá glass, hari, batkarar, daruna, ban akhor, gum, bis, bins, khurmani, sangtra and kela.
Umballa ...	Mango, jáman, ním, mulberry, tún, shísham, kachnár, sagaun, barota and lasúrá.
Kángra ...	Mango, jáman, mulberry, tún, shísham, apricot, tos, bamboo, simbal, dodun and deuches.
Simla ...	(Not reported.)

22. With reference to paragraph 9 of last year's review, I beg to remark that the following species have already been treated of in my "Hints," and I quote the page which may be referred to :—

Plains trees.		"Hints," page	*Plains trees*—concluded		"Hints," page
Jhand ...	Prosopis spicigera ...	121	Tún ...	Cedrela toona ...	110
Phuláí ...	Acacia modesta ...	119	Ohi ...	Acacia stipulata ...	109
Berú ...	Acacia leucophlœa ...	120	Siris ...	Acacia speciosa ...	108
Farásh ...	Tamarix Orientalis ...	121	Safed Sirs ...	Acacia elata ...	107
Kíkar ...	Acacia Arabica ...	101	Sissú ...	Dalbergia sissu ...	90
Bor ...	Ficus Indica ...	117	*Hill trees*		
Pípal ...	Ficus Religiosa ...	*ib*			
Mango ...	Mangifera Indica ...	116	Deodar ...	Cedrus Deodara ...	123
Jáman ...	Sizygium Jambolanum ...	*ib*	Blue Pine ...	Pinus excelsa ...	127
Bakáin ...	Melia Azedarach ...	115	Spruce ...	Abies Smithiana ...	
Ním ...	Azadirachta Indica ...	114	Silver fir ...	Picea Webbiana ...	128
Willow ...	Salixbabylonica and tetrasperma ...	113	Fir ...	Pinus longifolia ...	129
Beri ...	Zizyphus Jujuba and Lotus	112	Walnut ...	Juglans Regia ...	131
Tút ...	Morus Alba ...	111	Kakar ...	Pistacia integirima ...	

23. To the above I beg now to add the following list :—

Name—Botanical, English and Vernacular	Description of tree and its uses	Mode of propagation, and season for procuring seed or making cuttings
	PLAINS TREES.	
Moringa pterygesperma The Horse Radish tree "Goanjua"	A small tree with sub-divided light-green leaves and large sweet-scented white flowers ; bark light-colored, corky, much cracked ; fruit a long pendulous pod, ripens about April and is eaten by the natives. Twigs and leaves lopped for fodder. The wood is excessively soft and quite useless, and said to be not even fit for fuel. The roots have the flavor of horse radish, and are occasionally used for it.	By seeds ; fruit ripens in April. Thick cuttings do far better ; the sowings are not always successful.
Eugenia Jambolana "Jáman"	A tree with spreading and ascending branches forming a close shady crown ; bark greyish ; leaves shining dark-green ; flowers small, greenish-colored ; fruit purple or black. The tree is nearly evergreen. The heart-wood is reddish and strong, and not subject to worms, but is apt to warp, and is said not to last well in air, although it is a favorite for well work. Agricultural implements, sugar-mills, &c., are sometimes made of it.	By seed, which ripens in hot weather (June and July) and must be sown fresh.
Cerotonia Sitegera "Carob"	A slow-growing evergreen tree of small size ; leaves once sub-divided (primate), thick, shining ; males and females flower generally on different trees in tufts springing from the bark of the trunk or branches. The pod contains a nutritious mealy pulp which along the Mediterranean coast is used as cattle fodder and for human food.	By seed or by grafting, or by cuttings. Seed should be sown in February ; cuttings in spring. Seed sown in pots filled with fresh horse-dung and some earth germinates very soon and should be transplanted into other pots before the cotyledons drop off.
Terminalia Bellerica "Bahera"	A large tree with a tall straight trunk and broad massive crown ; young branches covered with light rust-colored down ; leaf-stalk longer than ⅛ of the leaf ; flowers yellowish-green without petals, with a strong offensive smell ; fruit egg-shaped, grey, a favorite food of deer and cattle, and used in dyeing and tanning, being one kind of the myrobolams of commerce. The kernel is eaten by men, but is not considered wholesome. Its yellowish wood is coarse-grained, and subject to the attacks of white-ants and other insects. Used in building, but in Kángra is considered unlucky when thus employed. In Kangra also the leaves are considered the best fodder for milch-cows.	By seed, which ripens during the cold season and should be sown in April.
Cordia Myxa "Lasúrá"	A moderate-sized tree 30 to 40 feet with a short trunk and a rounded crown ; foliage dense, light-green ; leaves ovate ; flowers small, white, in clusters ; fruit plum-shaped, pink or black, with a viscid sweetish pulp which is eaten as vegetable or pickled. It is also officinal, being given for coughs, &c. ; and in Sindh also fuse is prepared from the bark of this tree. The kernel is also eaten.	By seed, which ripens in May and June.
Cratœva religiosa "Barna"	A moderate-sized deciduous tree ; dark-green foliage ; affords capital shade when in leaf.	By cuttings
	SUB-HIMALAYAN AND HIMALAYAN TREES.	
Cedrela serratta Hill Mahogany "Drawa"	Bark dark-grey ; growth moderate. Heart-wood light-red and fragrant, open-grained. Wood used for furniture.	By seed
Ulmus Wallichiana Elms "Kani"	A large deciduous tree. Bark grey, rough ; heart-wood greyish-brown, moderately hard. The bark contains a strong fibre which is made into cordage sandals and slow matches. Wood used where deodar and *Pinus excelsa* are not procurable for the same purposes ; leaves used for fodder.	Seed produces in autumn
Populus celiata Poplar "Palach"	A large deciduous tree. Bark smooth, wood grey ; wood used for water-troughs, leaves as fodder. Commonly planted in plains and hills of the Punjab. A good avenue tree.	Raised from cuttings

To be sown in nurseries or *in situ*, and any special instructions necessary	Season for planting out	Distance to be planted apart	Natural habitat, and any peculiarities of growth, &c.
In nurseries ...	Rains or spring ...	For avenue 20 feet apart; a few mixed with other trees in an avenue work very well, and greatly improve the look of an avenue, but unfortunately they are short-lived.	Grows wild in the Sewalik region in the Eastern Punjab, and is seen commonly planted throughout the Province up to 1,200 to 1,500 feet, also commonly cultivated in whole India. It is doubtful whether it is long-lived enough to make a good avenue tree.
In nurseries or *in situ*, 3 or 4 seeds being sown and the healthiest seedlings kept.	In spring and during the rains.	For avenues young seedlings from a nursery may be put out 20 feet apart. It is a very handsome tree for avenue, gives good shade; the fruit is greatly eaten by the natives.	Commonly cultivated in the Punjab, though less frequent towards the north-west. Does not require a damp soil, but flourishes most in a light loam or sand. It is said to thrive on marshy or low-lying land.
In nurseries or pots, latter preferred; seedlings require protection from heavy rains and from the sun.	Spring and rains. Should be watered during the hot weather. Grows well under shade of other trees.	Is not an avenue tree as it grows at present, but what can be made of it by early education has not as yet been ascertained.	Some of the trees at Chánga Mánga have had yearly fruit since 1882-83. The carob grows well in the Agri-Horticultural Society's gardens in Lahore, and in the Carob plot near Government House under the control of the Forest Department. In Mádhopur Church compound there are some fine trees of it which bear fruit regularly every year. Once fairly established, which seems very hopeful, and male and female flowers somewhat more equally distributed than at present, the tree yields a most abundant fodder crop.
In nurseries ...	Rains ...	A fine handsome tree difficult to rear as an avenue tree; should be planted out 25 feet apart.	Grows in the eastern part of the Sewalik tracts and occurs planted, attaining a considerable size in some of the plains up to the Indus, and in the hills north of the Peshawar Valley.
Do. ...	Do. ...	Not an avenue tree; mixed with other trees along an avenue would look well.	Grows wild in the Sewalik tract up to the Rávi, and is commonly planted in the plains and on the hills up to 3,500 or 4,000 feet.
...	...	30 feet ...	Sewaliks.
Sown *in situ* or in nurseries.	Rains ...	20 feet apart ...	N. W. Himalaya up to 8,000 feet.
Nurseries or broadcast. Seedlings require light, and will not spring up in the shade.	Do. ...	40 feet ...	N. W. Himalaya between 3,500 and 10,000 feet; 80 to 90 feet high.
Do.	Do. ...	20 feet ...	Himalaya between 3,000 and 10,000 feet.

Name—Botanical, English and Vernacular	Description of tree and its uses	Mode of propagation, and season for procuring seed or making cuttings
Bauhinia Variegata "Kachur"	A moderate-sized deciduous tree. Bark grey; wood moderately hard; a good avenue tree; ornamental; used for agricultural implements. The bark for dyeing and tanning; leaves and flower-buds are eaten; flowers very handsome.	Seed ...
Grewia Oppositifolia "Dhâman"	A medium-sized tree. Bark grey; heart-wood hard, elastic and tough, used for oars, handles and bows. From the bark ropes are made; leaves used for fodder.	Grows easily from cuttings.
Cassia fistula The Indian "Amaltás"	A moderate-sized deciduous tree. Bark greenish-grey; heart-wood very hard—used for posts, carts, implements, rice-pounders.	From seed ...
Emblica officinalis Myrabolam "Amla"	A moderate-sized deciduous tree. Bark grey; wood red, hard, close-grainish; no heart-wood; wood is durable under water—is used for well work, also for implements, building and furniture; bark is used in dyeing and tanning, and medicine; fruit for food and preserves.	Seed ...
Acculus India Horse-chestnut "Bankhor"	A large deciduous tree. Bark grey; wood white with a pinkish tinge, soft, used for building troughs, platters, packing cases, wooden shoes; leaves used as fodder.	Seed—autumn ...
Quercus Incana Oak "Rhin"	A large evergreen tree. Bark dark and rough; heart-wood very hard, used for building, ploughs, makes good fuel and charcoal; bark used in tanning precesses.	Seeds, propagating in autumn.
Acer species Maple "Tarkan"	A moderate-sized tree. Bark thin, grey; wood white, hard, close-grained, is used for ploughs, bedsteads, poles to carry loads; leaves used as fodder for cattle.	Seeds, in autumn ...
Prunus padus Wild-bird cherry "Kalakath"	A moderate-sized deciduous tree. Bark dark and rough; heart-wood reddish-brown, with an unpleasant smell—a very handsome grain; in Hazára wood used in building sheds; leaves used as manure in rice-fields; fruit eaten.	Do. ...
Odina Wodier "Kamlai"	Large deciduous tree with few branches. Bark grey, smooth; large sap-wood; heart-wood red when cut, darkens on exposure, hard; yields a gum; wood is used for spear-shafts, scabbards, wheel-spokes, cattle yokes, oil-presses and rice-pounders.	Not known ...
Platanus Orientalis "Chinár"	A large deciduous tree; grows to a great size, and rather fast; a very shady tree; large-lobed leaves.	By seed, ripens in November.
Ailanthus glandulosa ...	A lofty tree, grows rapidly, throwing up root-suckers, and in France is employed for that reason to clothe the barren stony hills (see Manual, page 64).	By seed ...
Excacaria Sebifera "Mom-China"	A moderate-sized tree; gives good shade; very like sissú in appearance. Wood white, moderately hard.	Do. ...
Bombax Malabaricum "Simal"	A large deciduous tree with horizontal branches and large buttresses. Grey bark with conical prickles. Handsome red flowers; seed pod contains a fine silky fibre useful for pillows, &c.	By seed; ripens in autumn. Also by cuttings.
Castanea Vesca Spanish chestnut	A large tree, attains enormous age and proportions. The flowers appear in June, in long slender erect spikes. "The wood is comparatively rich in tannic acid (about 18 per cent.)" The importance of the tree rests on its adaptability for shade plantations, its nutritious nuts, and timber value. Under favorable circumstances bears fruit the tenth year after planting. Varieties obtained by grafting.	By seed; fruit ripens in November; should be sown in April.
Olea—grafted variety Olive	A tree not of great height—valuable for its fruit and oil, which, however, have not been produced in this country as yet in any quantity. Flowers in March-April, and fruits in August-November.	By seed of wild olive sown in April.

To be sown in nurseries or *in situ*, and any special instructions necessary	Season for planting out	Distance to be planted apart	Natural habitat. and any peculiarities of growth, &c.
Nurseries or broadcast. Seedlings require light, and will not spring up in the shade.	Rains ...	12 feet ...	Sub-Himalayan tract and throughout the forests of India.
...	Do. ...	20 feet apart ...	Is found up to 6,000 feet in the N. W. Himalaya—distributed all over India.
Nurseries or broadcast or *in situ*.	Do. ...	10 to 15 feet apart ...	Sub-Himalayan tract ascending to 4,000 feet, and throughout India.
Either nurseries, *in situ* or broadcast.	Spring or rains ...	10 feet ...	Dry forests of India and Burma.
Do.	Do. ...	20 feet ...	N. W. Himalayas, between 4,000 and 10,000 feet.
Do.	Do. ...	15 feet ...	Outer Himalaya from Indus to Nepál, from 3,000 to 8,000 feet. It can be grown in Punjab plains.
Do.	Do. ...	20 feet ...	Outer and middle Himalaya from the Indus to Assam, between 4,000 and 9,000 feet.
Do.	Do. ...	20 feet ...	Himalaya from Indus to Sikkim, 4,000 and 10,000 feet.
...	...	...	Sub-Himalayan tract from Indus eastwards—ascends to 4,000 feet.
In nurseries, ...	Rains ...	10 feet, and can be thinned after.	Greece, Armenia, &c., but is cultivated in N. W. Himalayas; grows from 2,000 to over 8,000 feet, would grow in the plains in a good loose soil.
Do. ...	Spring and rains ...	20 feet ...	Indigenous in Japan. A handsome tree not unlike tún, but leaves lighter green; it is in leaf when tún is not, and is a fine avenue tree. Light porous soil best.
Do. ...	Do.	10 feet and can be thinned after.	China and Japan. Introduced and cultivated throughout Northern India. The white pulp round the seeds gives the Chinese tallow which is separated by boiling in water; melts at 104°. Clayey soil.
In situ ...	Rains for cuttings. Seed when ripe in nurseries or *in situ*.	Any distance; if close, thin out.	Throughout India and Burma. Does not give much shade, but is a fast grower; requires a sandy loose soil; if grown in clayey soil throws out ungainly adventitious branches.
In nurseries, and watered at intervals. Great care should be taken to protect the seed from rats.	Rains, or from January to March	30 feet apart ...	South Europe, and temperate Asia as far as Japan. Lately introduced into the Punjab Himalaya. Thrives best in a temperate climate and moderate rainfall, and in a loose well-drained gritty loam. Growth at first slow.
In pots, with charcoal at the bottom. The soil should not be allowed to get sour.	April where water is available, or rains.	20 feet apart ...	Olea Europea from south-western Asia. Olea cuspidata N. W. Himalaya. The grafted variety is likely to thrive in Kanawar, but nothing certain is known at present.

24. I have already explained that but a comparatively small legitimate income can be derived from ornamental avenue trees, and that its advantages are more of an indirect nature: they cool the air and court atmospheric precipitates; their fallen leaves are so much manure, mineral nutriments prepared as infant food for young vegetation; and they give a more cheerful aspect to the otherwise often slightly monotonous scenery of the Punjab plains. A little annually recurring income is, however, extremely acceptable, and I would therefore advise that we should follow the example of the North-Western Provinces and plant out new avenues only with fruit and fodder producing trees. The same has been done in Continental Europe, and during the last thirty to forty years hundreds of miles of the stiff-looking poplar avenues with their pyramidical trees have had to give way to avenues of apple trees.

25. The main reasons reported to have caused failures after the first establishment of the plants are,—beds of *kankar*, clay and *shorá*, which, as I have already stated, must be dealt with during the first planting; secondly, the ravages of white-ants, especially in arid and very dry districts; this can, to a great extent, be counteracted by using healthy planting material and by careful planting; thirdly, in Delhi and other southern districts, hot winds, which can only be met with by increased watering; fourthly, storms, which threw down hundreds of trees at Rohtak, and which must be borne as they cannot be prevented; but apparently the greatest damage is done by camels, goats, sheep and cattle. This is bad, and we are, in this respect, in many districts hardly in advance of the Slavic provinces of Austria.* For instance, in the Kángra District the protection of the young trees put out in avenues may be put down as *nil*. In some places it is a little rough stone wall on which goats put their feet to feed more comfortably; in others it is a wicker work through which they can either stick their muzzles or over the top of which they can reach easily. In the course of a ride from Dharmsála to Baijnáth I saw 27 instances of goats or sheep or cattle nibbling roadside plants, and a careful examination will show that most of the roadside trees have at one time or other been treated to a course of browsing. I would request that the subject of protecting roadside plants and trees against damage by cattle should receive the special attention of every District Officer.

May I also draw attention to the beneficial effect caused by the closing of 350 acres against grazing in the Jhang District for the last two years.

The *tilla* insect continued its ravages on mango trees in the Muzaffargarh District.

26. The Deputy Commissioners of Ludhiána and several other districts remark on the dying out of mature trees, mostly siris, bakáin and mulberry.

Many of the Punjab trees are naturally short-lived; in others the period of life is shortened by the artificial manner in which they are grown, which prevents root development natural to the tree if grown under conditions of climate and soil most suitable to the species.

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* A report on planting of roads in Dalmatia says that the planting is done well, but the authorities have no money to spare for the protection of the trees and the inhabitants are utterly careless.

In many cases, again, the death of such trees is due to the roots reaching impenetrable strata, stagnant water, or sub-soil streams. I have my suspicion that this latter phenomenon has much to do with the dying of mature trees in the Umballa, Gujrat, Siálkot, and other districts underlying the Himalayas; but this assertion rests as yet on insufficient proofs. I have no doubt that bad and severe lopping has much to do with the premature death of many trees. Since my return to the Punjab nothing has pleased me more than to see the advances made almost everywhere in the lopping of trees. The half hacked, half torn stumps of branches which formerly met and offended the eye in almost every avenue, even in and about Lahore, are nowhere to be seen, and the greater care taken is everywhere evident. I would nevertheless draw attention to "Hints," pages 81 to 88, with special regard to the size of the branches to be removed, and the frequency of lopping. The severe lopping reported from Shahpur does not commend itself to me; that the trees send forth fine young branches is no criterion that the severe lopping was judicious, but only proves that it did not kill the trees outright.

27. The agency employed and the amount spent on establishment shows the greatest diversity, and I had to give up the attempt to compile a general establishment sheet. There are foresters, jamadárs, gardeners, peons, bhistís, málís, mates, beldárs, contractors, kúlís, and rákhás; and it might perhaps in future returns be possible to equalize at least the designation of the establishment employed. The districts of Ludhiána, Simla, Jullundur, Amritsar, Jhelum, Muzaffargarh and Dera Gházi Khan do not record the cost of establishment; the aggregate spent in the other districts amounts to Rs. 62,405.

II.—CANAL ARBORICULTURE.

28. The following table showing the progress of canal plantations during the year under review is compiled from the several reports and statements received, as far as this was feasible. I would, however, remark that several of the Divisions have sent neither the report in the prescribed form nor accompanied it by a working statement.

Statement showing the avenues and groves planted during the year 1882-83.

DIVISIONS	*Length of avenues planted*			*Groves in acres*			REMARKS
	In previous years	During 1882-83	Total	In previous years	During 1882-83	Total	
Bári Doáb Canal, 1st Division ...	311	2	313	1,487	72	1,559	
Do. 2nd „ ...	155	...	155	1,774	8	1,782	
Upper Sutlej Inundation Canal ...	301	...	301	...	...	...	
Lower Sutlej and Chenab Division, Inundation Canals ...	580	...	580	98	...	98	
Indus Canal, Dera Gházi Khan Division ...	115	14	129	42	...	42	
Sirhind Canal, Main Line Division ...	8	4	12	890	80	970	
Do. 3rd „ ...	3	...	3	1,277	413	1,690	
Do. 4th „ ...	...	3	3	63	93	156	
Do. 5th „ ...	...	...	...	1,010	422	1,432	
Western Jumna Canal, Karnál Division ...	138	...	138	6,616	6	6,622	
Do. Hánsi „ ...	...	202	202	...	...	...	
Do. Delhi „ ...	353	21	374	...	...	...	
Do. New Delhi „ ...	11	...	11	117	...	117	
Muzaffargarh Division, Inundation Canals ...	...	...	...	...	...	...	
TOTAL ...	1,975	246	2,221	13,374	1,094	14,468	

It will be observed from the above statement that the closing balances submitted in last year's table do not always tally with the opening balances in this year's report. I have, however, accepted the figures latest recorded, as the change in the area may be due to surveys or other adjustments necessitated in the area statements. The reports in which the alterations have taken place are silent on the subject, and it might be advisable if the opening balance for the next year could be somewhat more authoritatively stated. The work done during the year comprises the extension of 246 miles of avenues against 96 in the previous year, and the cultivation of 1,094 acres of groves against 1,055 in 1881-82. The extension of avenues has mainly taken place in the Western Jumna Canals, a few miles only having been planted on the Indus, Sirhind and Bári Doáb Canals. The cultivation of groves took place almost entirely in the Bári Doáb and Sirhind Canals. No progress whatever was reported from the Muzaffargarh Circle.

29. The subjoined table is a statement of the financial results of the year :—

DIVISION	Income			Expenditure			Surplus			Deficit			REMARKS
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	
Bári Doáb, 1st Division ...	9,315	0	0	8.577	0	0	738	0	0	...	...	...	
Do. 2nd „ ...	24.471	2	1	7,758	12	6	16.712	5	7	...	...	...	
Upper Sutlej Inundation Canal ...	3,022	0	7	1,576	3	11	1,445	12	8	...	...	...	
Lower Sutlej and Chenab Division, Inundation Canals ...	6,853	2	9	2,248	9	9	4,604	9	0	...	...	...	
Indus Canal, Dera Gházi Khan Division	402	0	0	3,006	0	0	...	...	...	2,604	0	0	
Sirhind Canal, Main Line Division ...	...	...	...	...	...	...	...	...	...	...	...	...	Not mentioned in report.
Do. 3rd „ ...	...	..	...	..	...	..	...	...	...	...	...	...	Ditto.
Do. 4th „ ...	...	...	...	...	...	...	...	...	...	...	...	...	
Do. 5th „ ...	...	..	...	1,431	2	5	...	...	...	1,431	2	5	
Western Jumna Canal, Karnál Division	786	0	0	776	0	0	10	0	0	...	...	...	
Do. Hánsi „	9,848	0	0	2,445	0	0	7,403	0	0	...	...	...	
Do. Delhi „	7,116	15	0	1,260	0	0	5,856	15	0	...	...	...	
Do. New Delhi Branch Division ...	*Nil.*			*Nil.*			*Nil.*						
Muzaffargarh Division, Inundation Canals	2,052	9	9	556	12	10	1,495	12	11	...	...	...	
TOTAL ...	63,866	14	2	29,635	9	5	38,266	7	2	4,035	2	5	Net surplus—Rs. 34,231-4-9.

The financial results thus show a net revenue of Rs. 34,231, which is very satisfactory indeed; but, unless the interest on the whole capital sunk and the cost of watering the area is charged, the results are to some extent fictitious.

I have calculated from the reports before me and the appended statements, as far as possible, the rates paid for sowing, planting, thinning, &c. The rates are very varying, and in many instances excessive. Thus, for instance, Rs. 5 is paid for thinning per 100 maunds which costs us at Chánga Mánga Re. 1-10 to Rs. 2. It is possible that the information on which my calculations are based are incomplete, and I would suggest that the reports should in future years contain the rates paid, so that I may be able to advise officers in case the rates paid are in excess of those of the Forest Department.

30. The methods adopted in raising plantations and avenues have been as follows :—

Bári Doáb.—Transplanting from nurseries, sowing on ridges with irrigation trenches.

Upper Sutlej.—Planting from nurseries and watering by bhistís, also spontaneous growth.

Lower Sutlej.—Transplanting, watering by bhistís, and by chaukídárs who cultivate the compounds and reap the produce in lieu of payment.

Indus Canal.—Transplanting with hand irrigation.

Sirhind Canal.—Transplanting from nurseries and sowing in pits.

Western Jumna Canal.—Spontaneous growth, sowing (method not given), transplanting, with irrigation.

Muzaffargarh.—Transplanting, with hand watering.

Of these, sowings on the ridge and trench system have been the most successful, and, wherever there is a command of the water-supply, it will be found in the end to be the least expensive. On the Sirhind Canal, pit sowing has totally failed. The objection to this method is the risk of swamping the young seedlings; and, where the water-supply is as uncertain, I would advise the establishment of small nurseries and transplanting.

The species of trees cultivated seem in most instances to have been judiciously selected, and a very wise beginning has been made in the Bári Doáb Canal of gradually replacing the more or less worthless siris, by jáman and mango trees.

31. The Superintending Engineer, Western Jumna, complains about the ravages by monkeys on all young plantations in the Hánsi and Delhi Divisions, and of the difficulty of obviating this nuisance without a large establishment, the cost of which would be almost prohibitive. Surely there are other and cheaper means of getting rid of monkeys when they become a plague in State plantations. Excessive cattle trespass, often resulting in the destruction of planted areas, is reported from the Bári Doáb and Sirhind Canal Circles. In the latter circle wire-fencing was found an insufficient protection, half a mile of it being utterly destroyed and cut to pieces. Under such circumstances it looks almost like irony to recommend the planting of aloe hedges, which, however, under ordinary circumstances are extremely effective. Perhaps the provision of Chapter XI of the Forest Act might be extended to canal belts by declaring them protected forests, and be found somewhat effective.

The large death-rate of trees in the Dera Gházi Khan Division has not been explained.

32. Extensive thinnings and fellings have taken place in the Bári Doáb Canal Circle, and cuttings have also been reported from the Indus and Sirhind

Canal Divisions. The proposals made by the Executive Engineer, Bárí Doáb Canal Division, of working fuel in a rotation of twenty years and timber by selection, is good, but I believe it will be found possible and profitable to reduce the rotation for fuel to fifteen years. As regards the selection of standard trees, experiments are being carried on in all plains forests under the Forest Department, the results of which will be published in course of time.

III.—ARBORICULTURE ON PROVINCIAL ROADS.

33. In consequence of paragraph 8 of last year's review, I have received reports from the Executive Engineers of the Road Divisions shown in the margin. I have not printed the reports, as many of them have not been drawn out with sufficient care, and as some of them are evidently the composition of some office subordinate.

1. Peshâwar.
2. Rawalpindi.
3. Lahore.
4. Amritsar.
5. Umballa.
6. Delhi.
7. Simla.
8. Derajat.

Of the statements accompanying the reports I could only use those of Peshâwar, Rawalpindi, Lahore, Amritsar and Mooltan. The otherwise well-written Delhi statement contains, amongst others, curiosities, such as 110,880 planted in the beginning of the year, no planting, no failures during the year, and nothing remaining at the end of the year; and, again, 316,140 feet at the beginning, 450 feet planted during the year, 90 feet failed during the year, showing a balance of 30 feet at the end of the year. In the statement of Amritsar it is reported that 94 miles of avenue lines failed—were destroyed or died. This is evidently a mistake, and embraces all trees which have died since the beginning of planting operations; I have accepted therefore the Amritsar opening balance for 1883-84.

The following table contains the result of the work done in the five Divisions above mentioned.

Progress Statement of Avenues on Provincial Roads.

1		2	3	4	5
Road or Canal on which avenues have been planted or are in course of construction		Length of single lines stocked with trees or established plants at the beginning of the year	Length of single lines planted during the year	Length of single line on which cultivation has failed, or on which trees or established plants have been destroyed or felled	Length of single lines stocked with trees or established plants at the end of the year
Name of	Total length in feet	Feet	Feet	Feet	Feet
PESHAWAR DIVISION.					
Kohát and Bannu Road—from Kohát to Lattammar in the Kohát Sub-Division	337,920	33,600	...	17,100	16,500
Kohát and Khushálgarh Road ...	163,680	30,544	...	15,915	14,629
Kohát and Hangu Road ...	132,000	31,680	...	31,680	...
Lahore and Pesháwar Road, Section from Pesháwar to Naushahra	121,440	127,840	1,000	...	128,840
Kohát and Pesháwar Road, Section from Pesháwar to Aimal Chabútra	116,160	61,810	...	...	61,810
Lahore and Pesháwar Road, Section from Khairabad to Naushahra	116,160	32,100	5,150	2,150	35,100
Road Kalaki Sarai to Abbott-abad ...	232,320	120,620	6,200	2,300	124,520
In future returns the Hazára trunk road will be considered to run from Hasan Abdál.	...	...	...	...	...
2nd section from Abbott-abad to Garhi Habibulla	179,520	44,880	...	7,480	37,400
Hasan Abdál and Haripur Road ...	109,560	26,400	1,500	400	27,500
Haripur and Turbela Road ...	68,640	32,800	600	300	33,100
Abbott-abad and Murree Road ...	26,400	13,973	...	3,247	10,726
Mansahra and Oghi Road ...	105,600	42,240	...	7,000	35,240
Mansahra and Shankiári Road ...	58,080	58,080	...	3,000	55,080
Shankiári and Chattar Road ...	105,600	10,560	...	...	10,560
TOTAL ...	1,873,080	667,127	14,450	90,572	591,005
RAWALPINDI DIVISION.					
Lahore and Pesháwar Road, Gujrat Section	211,200	153,120	...	...	153,120
Jhelum Section	158,400	73,920	...	...	73,920
Rawalpindi „	496,320	58,080	...	...	58,080
Do. and Baracow Road ...	...	63,360	...	...	63,360
LAHORE DIVISION.					
Road from Lahore to Umballa, Section Lahore to Atári	89,760	126,720 (Single rows of trees on either side)	21,120	10,560	137,280
Grand Trunk Road passing through the Station, including branch road to north of Fort of Lahore	21,120	52,800 (Double rows on either side in one mile)	10,560	...	63,360
Station Roads under the Executive Engineer at Lahore	73,920	147,840	21,120	...	168,960
Approaches to Shahdara Boat Bridge	5,280	10,560	...	...	10,560
Sutlej Bed Road	21,120	42,240	5,280	5,280	42,240
Ludhiána and Ferozepore Road ...	269,280	105,600	10,560	...	116,160
Lahore and Ferozepore Road ...	221,760	316,800 (Double rows in 10 miles on either side of road)	31,680	10,560	337,920
Kasur and Ráewind Road ...	95,040	84,480	31,680	21,120	95,040
Shahdara and Wazirabad Road ...	322,080	316,800	5,280	...	322,080
Siálkot and Wazirabad Road, Section in Gujránwála District	29,040	21,120	5,280	...	26,400
Lahore and Pindi Bhatián Road ...	369,600	126,720	31,680	21,120	137,280
AMRITSAR DIVISION.					
Grand Trunk Road	237,600	739,200	...	About 126,720 feet in patches here and there not exceeding 1,320 ft. lengths	612,480
Amritsar and Pathánkot Road ...	359,040	712,800	...	274,560	438,240
Pathánkot and Núrpur Road ...	31,680	126,720	...	63,360	63,360
Siálkot and Wazirabad Road ...	118,800	109,820	34,000	11,060	132,740
Siálkot and Gurdáspur ...	332,640	200,030	36,080	21,120	214,990
MOOLTAN DIVISION.					
Mooltan to Dera Gházi Khan ...	31,680	243,480	63,360	3,168	303,672

34. The species of trees throughout the Province were mostly sissú, kíkar, mulberry, farásh, siris, willow, ber, bahera and mango.

Of these, kíkar and mango do not grow in the north-west of the Province.

Nothing is reported about the methods used in the cultivation, nor the agency employed; but the results of the operations seem somewhat satisfactory in Mooltan, Amritsar, Jullundur and Lahore. In Delhi the cost of operation seems somewhat out of proportion to the advantages realized; it is reported that 1,205 trees were planted and 7,711 maintained at a cost of Rs. 2,929; however, with nothing but the excessively meagre reports before me, I may be mistaken, and much money may have been spent on permanent protection against cattle, which is preferable to the state of things reported from Pesháwar, where a considerable amount of money is spent on málís and watering, and none on protection. The state of things described by the Executive Engineer seems to be to grow the plants and care for them till they thrive well, and then to leave them to the mercy of cattle and Pathán villagers, who promptly abolish them. Other Divisions report that they have none, or insufficient, funds for protection, and deplore the consequent damage done by cattle. Simla and Umballa report that no arboricultural operations took place. Pesháwar reports on most roads the rainfall of the year as 120·8 inches. I beg to annex the reports furnished by the General Branch, Public Works Department, as a proof of the impossibility of compiling a comprehensive *resumé* either of the work or the financial results.

I.—DISTRICT ARBORICULTURE.

DELHI DIVISION.

Remarks by Commissioner.

Delhi.—In regard to the arboriculture report for the Delhi District, the Commissioner would call attention to the plan struck out by Mr. Maconachie for inducing the villagers themselves to turn their attention towards planting on their waste grounds. If the prizes proposed afford sufficient stimulus, there can be no question that a multiplication of these little plantations across the country will be most desirable in counterbalancing the clearings which the increase of cultivation is constantly causing. The Commissioner is sending an extract of this part of the report to the Gurgaon and Karnál Districts, in the hope that their District Committees will also adopt it. The plan of sowing kíkar seed in trenches is likely to be fairly successful in this district, considering how luxuriantly that tree thrives in these parts. Much could be done in this way to cover the Delhi Ridge, the bare exposed boulders of which have much to do with causing the great heat at Delhi in the hot season. The interest the District Superintendent of Police appears to take in promoting the growth of trees about his buildings is very satisfactory.

Gurgaon.—In regard to the Gurgaon District, it seems a waste of money to attempt avenue-planting across country liable to annual floodings, or where the soil is so adverse that the saplings have not vitality enough to resist white-ants. In such places a much better plan would be to endeavour to secure small plots of land on the nearest available high ground, and there plant a grove of shade-giving trees. The Commissioner observes with satisfaction the care that appears to be bestowed in this district on lopping, as doubtless much mischief has been done in the Province by rash and improper hacking, effected, too, with unsuitable tools. With regard to the Deputy Commissioner's remarks on the extensive clearings lately effected by the zamíndárs in his district, in addition to the plan alluded to as introduced into Delhi, of offering prizes for new plantations, the Commissioner thinks some good might be done if the Tahsíldárs were directed to use their influence to get the zamíndárs to re-sow these plots with the seed of hardy trees, or, at any rate, to preserve them from being grazed over till they have recovered themselves. They might be induced, too, to plant some of the hollows in the hilly ranges of the district, if sufficient inducements were held out to them.

Karnál.—What has been said above in regard to the low-lying roads in the Gurgaon District applies to those roads in Karnál in which the soil is adverse to tree-planting. There, the fruitless attempt should be given up, and attention turned to planting small groves where good soil can be obtained, as they are nearly as serviceable as avenues for native travellers.

1.—DELHI DISTRICT.

A.—Deputy Commissioner's Report.

General Remarks.—The rainfall was below the average, and was unequally distributed. This was unfavorable for tree-planting. Besides, injury was caused by the hot winds and white-ants, and, so, many seedlings and young trees were destroyed. There were, however, no other events specially affecting arboriculture.

An account of arboricultural operations within Delhi municipal limits has been supplied by the Secretary, Municipal Committee; and a copy of his report is annexed.

Outside municipal limits fair progress was made in tree-planting under the supervision of the District Committee and Tahsíldárs.

As stated in last year's report, good avenues already exist or are in an advanced state of formation on the following imperial roads, which are in charge of the Public Works Department:—

(1). Grand Trunk Road between Delhi and Karnál,
(2). Delhi-Mathrá road,
(3). Delhi-Rohtak road,
(4). Delhi-Gurgaon road *viâ* Mahrauli;

and on the two canals, the Western Jumna and Okhla, which traverse almost the entire length of the district from north to south.

As regards the district roads, the following list shows the progress made in tree-planting on the various roads, which are classified as fully planted, half-planted, and to be planted, in accordance with the instructions contained in paragraph 11 of the Arboriculture Report of the Conservator of Forests, Punjab, for 1881-82:—

	ROADS FULLY PLANTED.	*Entire length of road.* M.	F.
1.	Humáyun-Safdarjang tomb road	2	4
2.	Sonepat-Bahálgarh road	4	7
3.	Sonepat-Bhatgáon „	7	0
4.	Sonepat-Larsauli or Grand Trunk Road ...	5	0
5.	Tughlakabad-Mathrá road	3	0
6.	North and south branches Farídabad road ...	2	0
7.	„ „ Ballabgarh „ ...	0	2
	ROADS HALF-PLANTED.		
8.	Delhi-Gurgaon road to Basant	11	4
9.	Najafgarh-Basant road *viá* Pálam	9	7
10.	Delhi-Najafgarh road	12	0
11.	Sonepat-Múrtal „	11	0
12.	Sonepat-Jharant „	10	0
13.	Bahálgarh-Jhundpur „	6	0
14.	Badarpur-Mahrauli „	6	0
15.	Farídabad-Majhaola „	12	0
16.	Ballabgarh-Chhansá „	11	0
	* ROADS TO BE PLANTED.		
17.	Azádpur-Bághpat road (about a mile planted) ...	13	0
18.	Old Cantonment-Burári road	6	0
19.	Paik-ka-Makbara-Bowáná „	17	0
20.	Thána Kalán-Bághpat „	21	0
21.	Bhera-Bághpat „	5	0
22.	Kohát-Thána Khurd „	3	0
23.	Chhansá-Sikri „	11	0
24.	Farídabad-Atáli „	10	0
25.	Nángloi-Najafgarh road (about 2 miles planted)	7	0

Operations of the year.—The operations of the year under report consisted in tending and preserving the trees planted in previous years, replacing those which died during the year, and filling blanks on the—

(1) Humáyun-Safdarjang road,
(2) Delhi-Najafgarh „
(3) Badarpur-Tughlakabad „
(4) Sonepat-Bahálgarh „ and
(5) Sonepat-Múrtal „

Most of the trees on these roads are full-grown. The trees planted in recent years are progressing favorably, and have attained a height of from 1 to 15 feet.

Kíkar seed was also sown on some of the roads on which the seeds sown in the previous year had failed, as well as on one new road. The following is a detail of these roads:—

1.	Delhi-Najafgarh road	about 8 miles
2.	Azádpur-Bághpat „	„ 2 „
3.	Paik-ka-Makbara-Bowáná road... ...	„ 17 „
4.	Bahálgarh-Jhundpur „	„ 6 „
5.	Ballabgarh-Chhansá „	„ 2 „
6.	Sikri-Chhansá „	„ 2 „
7.	Farídabad-Majhaola „	„ 2 „
	Total ...	„ 39 „

Trenches were made along the roads about 2 feet in width at the top and 1 foot at the bottom and 1 foot deep, and kíkar seed was thrown in them about the beginning of August, just when the rains had set in. The soil of the Paik-ka-Makbara-Bowáná road is so largely impregnated

* On these roads there are some trees scattered here and there.

with *shor* (saltpetre) that the seed sown in it was completely destroyed. On the other roads the seeds germinated, but, owing to the untimely cessation of rain and the prevalence of hot winds, a large number of the seedlings was destroyed. A fairly large number of the seedlings, however, survived ; and if the process of sowing be continued year after year, and blanks be filled up, good avenues will ultimately be attained.

Nurseries and groves.—There are 7 nurseries under the supervision of the Tahsíldárs, and 2 (at Faridabad and Chhansá) under the supervision of the District Superintendent of Police. They are all well provided with young trees. The probable number of trees in each, and their condition, are fully described in the statement. 1,013 trees of various sorts were supplied out of the Mubárik Bágh nursery to the Delhi Municipality for transplantation on the municipal roads. There are about 3,120 trees now growing in it.

Police Buildings.—The plantation and maintenance of trees and groves at police stations, rest-houses and outposts are under the supervision of the District Superintendent of Police. 646 trees were planted at these places during the year under report. The following extract of a report furnished by the District Superintendent of Police describes the progress made in tree-planting at these places.

Description of Work.—It has not been necessary to do much planting during the past year, as nearly all the trees which were planted at the various police-stations, &c., in previous years were found to be in a fairly thriving condition. Therefore all that was required was to supply a few trees to replace those which died during the year. A garden has been laid out at Majhaoli, and planted with fruit and other trees. The percentage of trees planted successfully is 90.

Establishment and Supervision.—Four málís and eight bhistís are employed to look after and water the trees at the various police stations and posts, and a supervision is exercised over them by the officers in charge of these stations and posts. The pay of each málí and bhistí is Rs. 4 a month.

Financial results.—The total expenditure during 1882-83 for arboriculture was Rs. 537. Nothing was realized during the year by the sale of trees.

Tiláuri Rakh.—This rakh is well wooded, containing, according to the report of the Tahsíldár, 122,700 trees of sorts. Its management has been transferred from the District Committee to the Revenue authorities.

Encamping-grounds.—The soil of the encamping-grounds is largely impregnated with *shor*, and is unsuitable for tree-planting.

Eucalyptus plants.—The Secretary, Municipal Committee, has submitted the following report on the experimental growth of *eucalyptus* in the station gardens at Delhi :—

In the Roshnárá gardens the seedlings have made rapid progress, and the same may also be remarked of the seeds sown in pots and boxes. With a few exceptions the plants exhibit a healthy appearance. The seedlings that were transplanted from pots into the open ground have grown to a height varying from 15 to 24 feet. The plants produced from seeds are also in good condition, and it is intended transplanting them after the rainy season. There are 33 trees (*eucalyptus*) in the Roshnárá gardens, all of which seem to be improving, so that the result of the experiment in these gardens may be considered satisfactory. The Queen's gardens contain some 50 plants recently sown in pots ; these do not seem to thrive as favorably as those in the Roshnárá. I am informed that several plants, soon after being transplanted into beds, entirely failed, for which I have been unable to obtain any reliable explanation. It would appear from the conclusion arrived at by the Revd. Mr. Smith, who was for many years in charge of the Queen's gardens, and who had on several occasions made the attempt of rearing the *eucalyptus*, that, in his opinion, he considered its failure was due to the extreme heat and moisture of the Delhi climate ; but, from the apparent success of the experiment in the Roshnárá gardens, Mr. Smith's reasoning would not appear justifiable. In the Kudsiá gardens, the plants, though healthy in appearance, are maturing slowly. A few died when transplanted into the open, but the remainder seem improving.

The instructions furnished by Dr. Schlich on the sowing and raising of the *eucalyptus* have been attended to at all times, and much care is taken by affording the young plants every protection.

Scheme for the encouragement of planting by zamíndárs.—The apathy of the zamíndárs towards tree-planting has been a great drawback to the progress of arboricultural operations. With a view to stimulate their co-operation by interesting them in this matter, Mr. R. Maconachie, Judicial Assistant Commissioner in this district, prepared a scheme for the encouragement of plot planting by zamíndárs. He proposed that the zamíndárs should be induced to plant trees in portions of their hitherto uncultivated lands, that plots so planted should be inspected every year by the District Officers, and that prizes should be

awarded to successful competitors. He prepared the following rules to regulate the distribution of these prizes:—

RULES.

Rule I.—The trees grown in accordance with these rules, and the ground on which they are planted, will remain the property of the persons previously owning such ground. Government does not seek to acquire any property in the same, nor to exercise any authority of dealing with the trees except as hereinafter provided.

Rule II.—Rewards are of two classes—Class A is for plots of not less than one pakká bígha, or 3,025 square yards; class B for plots of not less than one kachchá bígha, or say 1,000 square yards.

Rule III.—For the best plot of trees in each tahsíl grown under the conditions hereinafter specified—

(i) In class A, a sum of Rs. 40 shall be awarded, payable in three yearly instalments of Rs. 20, Rs. 10, and Rs. 10 respectively.

(ii) In class B, a sum of Rs. 20 shall be awarded, payable in three yearly instalments of Rs. 10, Rs. 5, and Rs. 5 respectively.

For the next best plot of trees in each tahsíl grown as above—

(iii) In class A, a sum of Rs. 30 shall be awarded, payable in three yearly instalments of Rs. 14, Rs. 8, and Rs. 8 respectively.

(iv) In class B, a sum of Rs. 10 shall be awarded, payable in three yearly instalments of Rs. 5, Rs. 3, and Rs. 2 respectively.

(v) For every plot of ground competing under these rules for rewards, in respect of which the procedure hereinafter laid down for sowing shall have been fairly complied with, an allowance of Rs. 3 for class A and Rs. 2 for class B shall be awarded, payable at the end of one year after such sowing.

Rule IV.—All trees grown under these rules must be sown in ground which has hitherto been uncultivated.

Rule V.—If a single person owns the land to be sown, he can, without further notice to any authority, enclose and sow the plot he competes with, in the manner now to be indicated. If the land is *shámilát* and a single person wishes to sow it, he must make arrangements with the proprietors through the Tahsíldár. If the land is *shámilát* and all the proprietors concert to sow it, they can do so after causing the patwári to note in his diary the fact, and the particulars of arrangement among themselves.

If the land is *shámilát* and concert among all the proprietors is not obtained spontaneously, then the applicants should have the good offices of the Tahsíldár, who will use his influence, but not his authority, to obtain concerted action.

Rule VI.—The sowing is to be made during the rains; the ground sown is to be enclosed by a kachchá wall of not less than two *háths* in height, and outside the wall is to be a trench right round the enclosure of not less than one *háth* in depth and two *háths* in breadth. The wall is to be kept up, and the trench to be kept clear, during the term of competition; and in the lower part of the wall on the outside are to be planted slips of farásh (*Tamarix Indica*). The trees sown inside the enclosure may be either kíkar (*Acacia Arabica*), nim or shísham. The award will be based upon consideration of the promise of timber apparent in the young trees, and the efficiency of protection provided for them.

Rule VII.—All awards are made subject to the condition that the trees shall not be cut down before the completion of ten years from sowing. The instalments are to be paid only if the observance of the conditions herein mentioned is continued. If, at the end of the third year, the plants require to be thinned, this will be done under the supervision of the zaildár of the circle wherein the land is situate.

This scheme was laid before a meeting of the District Committee, and was unanimously approved by all the members. One thousand copies of it have been printed in Urdú for distribution in the district, with directions to the Tahsíldárs and patwáris to explain them to the people. Registers for recording the names of intending competitors have also been opened in the tahsíl offices, and the District Committee have agreed to the allotment of funds for prizes. Further action in the matter will be taken in the present rainy season.

Future plan of operation.—The future working plan of arboricultural operations, a description of which is called for in paragraph 7, clause II of Punjab Government Proceedings No. 105, dated 20th March 1883, will embrace—

Firstly, the working out of the scheme above described;

Secondly, the maintenance and planting of trees at police stations, outposts, &c.;

Thirdly, the planting of trees on irrigation bunds; and

Fourthly, the maintenance and raising of avenues on roads.

There are several irrigation bunds now in the district, and the construction of many others is under contemplation. These irrigation bunds are large embankment enclosures in which rain-water running down high lands is received and retained for the purpose of irrigating the adjoining lands, partly by percolation and partly by means of a system of sluices in the embankments. The planting of trees along these embankments is highly desirable. As regards roads, the present plan of raising avenues by sowing kíkar seed in trenches will be continued, as it is less expensive, and requires less supervision, than planting trees.

As regards lopping, only such branches are cut as are found to be overhanging the roads. The work is done by the District Committee málís with saws (*árís*) in June, July and February.

The young trees are weeded by slightly turning up the earth with a spade and removing the grass growing round their roots.

Whenever young trees are required for transplantation, they are dug so as to have their roots enclosed in a layer of earth from 1½ to 2 feet in depth.

Establishment.—The establishment employed during the year on the different roads and plantations cost Rs. 5,063-0-1, and consisted of the following staff:—

	Rs.	A.	P.
Foresters and jamadárs	121	0	0
Peons	10	0	0
Chaukídárs	120	0	0
Málís	737	7	6
Bhistís and pakhálís	3,775	11	7
Grahmís or jafrí makers	298	13	0
Total ...	5,063	0	1

Each Tahsíldár supervises the arboricultural operations within his tahsíl. He is assisted by the road overseers and members of the District Committee. His work is also inspected by the District Officers during their tours of inspection.

Financial results.—The financial results were as follows:—

Receipts.

	Rs.	A.	P.
District Funds—			
Sale of trees on roads	136	6	4
„ „ bunds	273	0	2
Income of Tiláuri rakh	495	3	6
	904	10	0
Delhi Municipality—			
Sale of grass, and grazing fees	3,102	8	6
„ decayed trees	310	4	0
Boat contract	31	0	0
	3,443	12	6
Total	4,348	6	6

Charges.

	Rs.	A.	P.
District Funds—			
Establishment	1,723	3	1
Subscription to Agri-Horticultural Society ...	120	0	0
Maintenance of trees in police rest-houses ...	149	0	0
Cost of collecting and sowing kíkar seed on roads	149	0	0
Miscellaneous	66	9	9
	2,207	12	10

Delhi Municipality—		Rs.	A.	P.
Establishments		3,339	13	0
Construction of brick plant-protectors ...		613	0	0
Construction and repairs to jáfri		208	8	1
		4,161	5	1
Total ...		6,369	1	11
Deficit ...		2,020	11	5

The decrease in the District Fund expenditure is due to the transfer of the management of the Tiláuri rakh from the District Committee to the Revenue authorities.

B.—Delhi Municipal Secretary's Report.

In compliance with your No. 305 of the 5th ultimo, I beg to submit the Annual Arboriculture Report for the year ending 31st March last, prepared in accordance with the instructions contained in Secretary to Government, Punjab's No. 119 F. of the 16th March 1881.

General Remarks.—No event specially affecting arboriculture within the limits of the Delhi Municipality occurred during the year.

Description of Work.—The only important work undertaken during the year was the planting of trees on the sides of a new road recently constructed in the Civil Lines. The young trees planted are from 3 to 4 feet high, and were procured from the gardens under the management of the Municipal Committee. There were 472 trees planted, consisting of nim, siris, shisham, jáman, &c. This work necessitated a large expenditure, being incurred towards providing tree-protectors to save the plants from being destroyed. I am glad to report that up to the present the young plants have made fair progress, and the result may therefore be considered satisfactory.

Of the other roads in the Civil Lines, the following detail will show the number of trees planted :—

Mori Gate road	14
Circular road to Kabul Gate	27
Flag Staff road	24
Rájpur road	300
Alípur road to Mubárik Bágh	384
Kashmír Gate to Rájpur road	24
Under Hill road	73
Tís Hazári road	19
Ridge road	9
The Park	250
Mori Gate to Boulevard	12
Boulevard road	24
Total ...	1,160

The avenues on these roads have been completed from time to time, but, owing to unknown causes, some of the trees, soon after being planted, wither and die, and have to be replaced. Roadside planting was extended on the Alípur road in the direction of Mubárik Bágh. There were 384 trees planted, and a similar number of brick enclosures erected for protecting the plants. The roads in the Civil Lines are uniformly lined with trees, which are properly maintained and supervised.

Further improvements have been made to the Park. Additional number of trees were planted, and those of last year have made fair progress. The huge mud mound situated in almost the centre of the Park will be removed altogether very shortly, and the space which it now occupies will be planted with trees. The work has been commenced, and is in progress.

The planting of trees in the suburbs was well attended to, as will be seen from the following result.

Roshnárá road	...	... 30
Grand Trunk Road	...	... 15
Bangásh road	...	... 20
Bangásh bridge to Roshnárá	...	... 5
Ajmere Gate triangle	...	... 38
Delhi Gate triangle	...	... 45
Pahárganj to Jai Singhpura	...	... 62
Kutab road	...	... 28
Circular road	...	... 123
Delhi Gate plot	...	... 15
	Total	... 381

The avenues on these roads are in good order, and mostly all the trees are full-grown, having been planted many years ago. Occasionally some few trees wither up, but they are at once removed and others procured and substituted.

The undermentioned roads in the city were replenished with plants during the year :—

Lothian road	...	... 15
Hamilton road	...	... 44
Level-crossing	...	... 10
Triangle opposite College	...	... 22
Triangular plot opposite Church	...	... 30
Mori road	...	... 22
Esplanade road	...	... 5
	Total	... 148

In regard to the above roads, the work done during the year consisted of merely filling up gaps where necessary, and replacing dead trees where required.

The income derived from the Belá plantation during the year is shown below :—

		Rs.	A.	P.
Sale of grass, and grazing fees ...	...	3,102	8	6
„ decayed trees ...	...	310	4	0
Boat contract ...	...	31	0	0
Total	...	3,443	12	6

The expenditure incurred on the Belá amounted to Rs. 683-5-3. The plantation is in a very healthy condition. The undergrowth has again sprung up, but will be cut down and cleared soon after the ensuing rains cease. The supervision of the plantation is conducted by a Forester entertained on a salary of Rs. 25 per mensem.

With reference to paragraphs 2 and 3 of circular No. 15 of the 11th April last, from the Conservator of Forests, Punjab, I beg to state that very little is done in the way of lopping. Occasionally it becomes necessary to remove pendant branches when they are found to be in the way. The lopping of trees is conducted under the direct supervision of the ward jamadárs, and only a few of the branches that are found to be overhanging the roads are cut away. This work is generally attended to in the months of October and November. The instructions contained in paragraphs 73 to 77 of letter No. 417, dated 3rd August 1871, from the Conservator of Forests, Punjab, on the subject of lopping and pruning of roadside trees, are, as a rule, acted upon.

The sum expended by the Committee towards the maintenance of arboriculture amounted to Rs. 4,161-5-1, against Rs. 4,724-9-2 in the preceding year. The details comprise—

		Rs.	A.	P.
1. Salaries of establishment	...	3,339	13	0
2. Construction of brick plant-protectors	...	613	0	0
3. Construction and repairs to jafrí protectors		208	8	1
Total	...	4,161	5	1

I herewith beg to append the usual statement showing the works executed during the past year within municipal limits.

2.—GURGAON DISTRICT.

General Remarks.—The rainfall was fair, and the result of the plantings satisfactory. The work was chiefly confined to filling up gaps in avenues already planted. In the Palwal tahsíl the planting of the Palwal-Firozpur road up to Hattín was completed.

The new plants suffer most during the months of May and June from the scorching winds, and a good number perish year after year. A good deal of damage is done by cattle also, and efforts are being made to protect all young plants by thorn-fencing.

Kíkar is being sown broadcast along roads where the soil is unsuitable for other trees. The seedlings along the Gurgaon-Kutab road between the 2nd and 5th miles are beginning to show, and those on the Gurgaon-Firozpur road between Nuh and Firozpur are springing up, and in parts are forming fine avenues. The farásh cuttings planted along the same road between Sohna and Nuh have not been successful. A stratum of kankar occurs near the surface, but it is possible, by removing or digging through this, to find soil which will admit of kíkar planting. A serious drawback on this road is, that the low country through which it runs is generally flooded for three or four months in the rains, and this excess of water has destroyed several crops of seedlings in succession.

Complaints of the damage done to plants by white-ants come chiefly from the Rewári tahsíl. The trees planted along the new Rewári-Jhajjar road are doing very well.

The lopping of trees was generally throughout the district carried out during the months of December and January. Special care was taken in lopping the trees along the Gurgaon-Firozpur, Sohna-Palwal, and Palwal-Nuh roads. The work was in charge of the District Engineer, and was done under the supervision of the Forester, Saiyad Hasan, who, at the head of a gang of 8 men from the establishment of málís and bhistís, worked along these roads. The work, while in progress, was frequently inspected by the District Engineer. The saw was exclusively used for cutting off branches, and the work done judiciously.

Charcoal-burners have started extensive operations in parts of the district where kíkar, raunj and jánt (*Acacia Arabica, a. leucophlœa,* and *Prosopis spicigera*) abound, and extensive tracts have been very nearly cleared of trees, especially in the neighbourhood of Nuh, Firozpur and Rewári. Near the latter town an extensive rakh, consisting chiefly of jand and jánt, has been more than half cleared away. The charcoal is sent by rail to Delhi and Ajmere. It is the general agricultural depression which has led the zamíndárs to adopt the suicidal policy of cutting and selling their timber to relieve their present needs.

The bare ranges of hills that run through the district offer a field for experimental forest sowing. There is no doubt that conservancy alone would do much towards the reboisement of the hillsides, for even at present there are some portions held sacred to a saint or Pír where the kíkar, raunj, karíl and dhák are growing luxuriantly. An officer of the Forest Department, Mr. Down, made a careful inspection of these ranges a couple of years ago, with a view to recommending some scheme for their planting; his visits have not yet had any practical result, and the cost of demarcating any portion of these hills as a Government preserve would probably be prohibitive. A system of conservancy by the voluntary efforts of the people is the only one which could be tried with any prospect of financial success.

New and extensive nurseries have been established at Palwal and Sohna, the former irrigated by a channel from the Agra canal.

Future plan of operations.—The working plan proposed for this district is as follows:—

During the current year the Tahsíldárs will direct their attention to completing the avenues on the most important roads:—

Palwal.—Roads from Palwal to Sohna, Nuh and Hattín.

Firozpur.—Roads to Alwar and Nuh.

Rewári.—Road to Jhajjar.

Náh.—Roads to Sohna, Rewári and Firozpur.

Gurgaon.—Roads to Bahádurgarh and Delhi.

Description of Work.—The following is a record of work done :—

1	2	3	4	5	6
Tahsil	Road or nursery	Condition at the beginning of the year	Trees planted	Successful out of those planted during the year	Percentage successful
Gurgaon ...	Gurgaon-Firozpur (Gurgaon Section) ...	18,526	795	205	26
	Basai road	353	272	172	63
	Gurgaon Railway Station road ...	7,045	260	210	81
	Gurgaon-Bahádurgarh	3,480	1,900	1,760	93
	Gurgaon-Kutab road	2,250	1,600	1,100	69
	Palwal-Sohna	4,896	95	52	55
	Bahora-Tauru	2,145	95	4	4
	Farakhnagar Railway Station road ...	602	298	63	21
	Civil Station roads	2,590	350	320	91
	„ grove (Bir)	2,800	...	...	...
	Station garden nursery	1,800	3,419	3,282 planted out on roads	
	Bhúndsi rest-house	2,500	planted	out on roads	1,919
	Sohna nursery	...	1,247	1,247	100
Nuh ...	Gurgaon-Firozpur road (Nuh section) ...	2,043	1,225	1,117	91
	Nuh-Palwal	958	355	263	74
	Nuh-Rewári	2,247	1,609	1,450	90
	Hattín-Palwal	1,077	765	625	82
	Tauru nursery	11,402	1,254	1,154 planted	out on roads
	Nuh „	286	3,692	2,865 „	„
Palwal ...	Palwal-Sohna road	1,800	800	600	75
	Palwal-Nuh „	289	800	750	94
	Palwal-Hattín „	781	600	350	58
	Nursery at Palwal	586	320	226 planted	out on roads
	„ „ mile No. V Palwal-Sohna road	900	...	500 „	„
	„ „ „ No. II „ ...	400	400	300 „	„
	„ „ Palwal-Hattín	250	800	200 „	„
	„ „ Palwal-Nuh	90	200	90 „	„
	„ „ Palwal-Sohna	...	8,300	3,300 „	„
Firozpur ...	Gurgaon-Firozpur (Firozpur Section) ...	1,811	50	50	100
	Firozpur-Alwar road	1,004	60	60	100
	„ Tijara (Jhirka) road	467	125	125	100
	Firozpur nursery	*Nil*	3,225	2,100	65
	Bhadas „	...	646	642	99
Rewári ...	Rewári-Jhajjar road	790	100	70	70
	Circular „	1,553	2,309	2,273	98
	Rewári-Jhajjar road nursery	350	150	150	100

Wells were sunk or deepened on Gurgaon railway station road ; 2 wells cleaned :—

Sohna-Palwal road	...	... 3 wells made 2 „ cleaned
Gurgaon-Sohna road	...	... 2 wells made 5 „ cleaned
Sohna-Nuh road	...	... 1 new well 1 well cleaned
Palwal-Hattín road	...	... 1 new well

Thaslás were erected for the protection of young trees on Gurgaon-Sohna Civil Station roads, and Rewári circular road. Measures were also taken during the winter to protect trees from frost by the ordinary method of enclosing them with straw.

Establishment.—The following establishment has been kept up :—

Gurgaon tahsil.

1	Daroga	at Rs. 12	per	mensem.
1	„	„ „ 10		„
17	Málís	„ „ 4	each	„
1	Málí	„ „ 5		„
12	Bhistís	„ „ 4	„	„
10	„	„ „ 5	„	„
1	„	„ „ 7		„

Nuh tahsil.

9	Málís	at Rs. 4	each	per mensem.
1	„	„ „ 5		„
6	Bhistís	„ „ 4	„	„
7	„	„ „ 6	„	„

Firozpur tahsil.

6	Málís	at Rs. 4	each	per mensem.
2	„	„ „ 5	„	„
6	Bhistís	„ „ 7	„	„

Gurgáon Tahsíl.—This establishment is not regularly kept up. In May and June additional bhistís are entertained until the rains set in, and then all are dismissed until November or December.

The arboriculture of the district is under the charge of the District Engineer, who is assisted by the Tahsíldárs and zaildárs. Two Foresters were employed during the year 1882-83, one of whom, paid from Provincial and District Funds, had charge of all roads in the Civil Station and its neighbourhood; and the other, who was trained at Chánga Mánga, was employed in various parts of the district, but, having proved an utter failure, has since been dismissed.

Financial results.—The receipts and charges of the year are given below :—

Receipts.

	Rs.	A.	P.			
From sale of trees	488	4	3			
„ grass	230	14	0			
				719	2	3

Charges.

Pay of málís	1,760	12	3			
„ bhistís	2,037	2	9			
„ 2 darogas	262	0	0			
Planting trees	220	8	10			
Making *thaslás*	57	3	0			
Protection of trees	76	11	0			
Making and clearing kachehá wells ...	37	10	0			
Compensation for land taken up for Palwal-Sohna nursery	41	4	0			
Huts for málís	5	8	0			
Painting railings of a nursery	34	0	0			
Clearing ground, &c., for nurseries ...	26	2	5			
Repairing implements	3	4	0			
				4,562	2	3
Deficit ...				3,843	0	0

3.—KARNAL DISTRICT.

General Remarks.—The rainfall was less in tahsíls Karnál and Pánipat, while it was more in tahsíl Kaithal, than the average of the five previous years. There have been no events peculiar to the year affecting tree-plantation in this district.

Description of Work.—The following tabular statement shows the work done this year :—

	Name of Road	New work	Number of trees died	Number of blanks filled up	Number of trees received maintenance including those planted this year
1	Karnál and Kaithal road	...	367	367	1,556
2	„ Meerut „	...	70	...	...
3	„ Saháranpur „	...	72	72	112
4	„ Hánsi „	...	122	122	283
5	„ Jagádhri „	...	200	...	...
6	„ Fírozpur „	...	150	150	876
7	Station roads	172	170	170	1,956
8	Road round the Karnál City	...	135	135	818
9	Kaithal and Jínd road	...	35	35	800
10	Pánipat and Sananh „	...	730	730	1,750
11	Deoband and Asandh „	...	...	...	280
12	Kaithal and Pihewa „	66	...	...	66
13	Grand Trunk road to Kothí Pánipat	...	...	...	543
14	Pánipat Kothí to Rer Escape	...	...	...	686
15	Chhajpur and Sewa road	2,342	...	...	2,342
	Grand Total Rs. ...	2,580	2,051	1,781	12,068

It will be seen that the blanks on the Karnál and Meerut, and on the Karnál and Jagádhri roads have not been filled up. On the former road, owing to the repeated failures in consequence of the badness of the soil, the attempt to raise trees has been given up for the present; and on the latter, until operations can be undertaken on its entire length. The trees formerly planted mostly proved unsuccessful owing to reh, &c., but it is hoped to take up this road again when a good deal of attention can be devoted to it.

Four furlongs of the station road have been planted out with trees. There are now seven furlongs remaining unplanted, which, however, do not require trees at present. The trees planted out on the station roads during the past few years are growing up rapidly. A great deal of attention has been devoted to the protection of trees on these roads. In a few years most of them will be beyond the want of protection.

In future it is proposed to devote attention first to the watering and protection of trees already planted out on different roads until they require no longer any maintenance. If, after providing for such maintenance each year, there are funds available, one road in each tahsíl, or a portion of it, as may be, will be taken in hand and completed until all the roads entered in the return given above are planted out with trees. By this means it is hoped to devote more care and attention to the work of planting than if several works were in progress at the same time.

There are three nurseries in this district—at Karnál, Pánipat and Kaithal. As plants are taken out of these nurseries, seed is sown, and a fresh supply of plants is thus regularly maintained. Over 4,000 trees were removed from the nurseries for transplanting on roadsides, &c., and there are at present about 10,000 more fit for transplanting.

The lopping of trees is carefully performed in this district in accordance with paragraphs 73 to 77 of letter No. 417, dated 3rd August 1871, from the Conservator of Forests, received with Commissioner's circular No. 6—63, dated 10th January 1878. Fifty copies of the vernacular translation of these paragraphs were received from the Commissioner's office, and they were circulated to the Tahsíldárs for general information. A dozen hand-saws were procured from Calcutta for pruning, and orders were issued forbidding the use of any other instrument. Very little lopping is done in this district. The work is carried out by daily labor under the supervision of the Tahsíldárs and their Náibs, assisted by the nursery establishment.

Establishment and Supervision.—The following establishment was maintained :—

8	Mates	Rs.	354
15	Málís	„	826
8	Pakhálís	„	529
55	Bhistís	„	1,873
	Total ...	„	3,582

Financial results.—Under this head the charges amounted to Rs. 5,755, and the receipts to Rs. 130, showing a deficit of Rs. 5,625. The following is a detail :—

Receipts		Particulars of charges		Amount
	Rs.			Rs.
		8 Mates		354
		7 Málís		322
Sale of trees	79	8 Pakhálís		529
		55 Bhistís		1,873
Sale proceeds of station garden fruits, vegetables, &c., &c.	51	Planting 2,580 trees		100
		Construction of 1,064 fences		488
		Repairs to 5,723 fences		903
		Miscellaneous charges		278
		Nurseries.		
		8 Málís		504
		Miscellaneous		164
		Subscription to Agri-Horticultural Society ...		240
		Total ...		5,755
Total ...	130	Déficit		5,625

HISSAR DIVISION.

Remarks by Commissioner.

An inspection of the statements will show that the subject of arboriculture has engaged the attention of the District Officers, and many efforts were made for the extension of operations, but it is evident that the existing means to that end, and the method to be pursued, are neither sufficiently understood. For instance, Mr. Ogilvie says that little can be

done in the tahsíls of Barwála and Fatahabad, whereas peculiar facilities exist there for the creation of veritable forests. Major Wood has only just taken charge of Sirsa, and has therefore had no opportunity of carrying out the views which he has brought with him from Fírozpur, but his remarks in his report show that he has observed the system pursued there to some purpose. That system, as introduced by Commissioner some years ago, he has endeavoured to explain in a circular memo. to Deputy Commissioners, of which a copy is attached.

In paragraph (3) of that memo. it has been suggested that Deputy Commissioners should obtain permission to apply to arboriculture the income which they earn by arboriculture. This seems only reasonable, and much zeal cannot be expected from District Officers in creating a valuable property, the income of which is taken away from them instead of their being allowed to apply it to the development of that property. The Commissioner is free to confess that he himself, as Deputy Commissioner of Fírozpur, employed in this manner the money that was earned. This was reported in Commissioner's Canal Report of 1876. It would, however, have been better had specific sanction been obtained, and the consequence of not doing so was that, as Commissioner has learned from Bábú Myá Dás (Extra Assistant Commissioner in charge of the arboriculture department of Fírozpur), his successor would not take the responsibility of maintaining the practice, and arboriculture in Fírozpur has received a severe check in diminution of funds. The Deputy Commissioners of this Division have therefore been asked to submit regular estimates and proposals for an arboricultural department, which will, it is hoped, be sanctioned when forwarded.

Copy of Circular Memo. No. 75, dated 13th June 1883, *from* Lieutenant-Colonel L. J. H. GREY, C.S.I., *Commissioner and Superintendent, Hissar Division, to the Deputy Commissioners of the Division.*

With reference to paragraph 4 of the Proceedings of the Lieutenant-Governor, No. 105 of 20th March 1883, I would suggest to the Deputy Commissioners of this Division concentration of effort in the matter of arboriculture. My experience (under circumstances somewhat more favorable than exist here) has been that every roadside tree brought to maturity (*i.e.*, through the first three years of its life) costs Rs. 2-8, while trees in groves cost less than a fifth of that average sum. For this reason alone the plantation of groves is preferable to that of avenues, and facility of management also is in favor of the former. Finally, the difficulties in the way of creating avenues are insurmountable in many parts of these districts, where, nevertheless, it is quite possible to raise groves. The extensive plantation at Desú Mulána, in the most arid part of the Sirsa Rohi, is a case in point. If the energy of a single Sikh (an ordinary zamíndár) and his family can create a fine plantation under such circumstances, we need not despair of similar success in any part of any of the three districts.

(2) To this end land is required, and land susceptible of irrigation. Rohtak possesses land in the Jhajjar Bírs, Hissar in the Hánsi Bír, and Sirsa in the Bír round the station and in the Nazúl waste area immediately outside Fázilka. Of these, the Jhajjar Bírs are not susceptible of irrigation, the water being far below the surface, and also salt; the Hánsi Bír is commanded by the Western Jumna Canal; the Sirsa Bír can be irrigated by wells; and the land at Fázilka is included as Abnosh, or irrigable area, of the Fázilwah canal. But besides these large areas, which are chiefly required as grass-preserves,* and which can only afford small room for the cultivation of trees, small patches of land for groves are required all over the districts, and they can now be cheaply bought, at any rate in Hissar and Sirsa. In Fírozpur I bought land in this way whenever I could make a favorable bargain, and Deputy Commissioners on the move have great facilities for finding such bargains. In the Barwála and Fatahabad tahsíls of Hissar, and in the Sirsa and Fázilka tahsíls of Sirsa, it must certainly be easy to find patches of land to be had cheap, and which can be cheaply irrigated. For three months in the rainy season of the year the Ghaggar is flowing, and sometimes in the winter as well, and water stands in hollows in its bed for many months afterwards; facilities for cheap and efficient *jhalár* irrigation are thus afforded. In the Choya basin, moreover, and in depressions irrigated or irrigable by Ghaggar spills, there are ample facilities for the creation of fine plantations—the irrigation required while the Ghaggar is dry being afforded in the former by kachchá tanks, and along the Ghaggar by wells. In the Hittar and Utar chaks of Sirsa and Sutlej, water is, or will shortly be, available by means of the Fázilwah and Mubárikwah canals, and in the former well-irrigation is cheap and easy. In Rohtak the Sáhibi floods and the Ganda Nallá rain drainage afford the means, if properly utilized, in conjunction with wells, of creating numerous groves in the Jhajjar and Sámpla tahsíls.

(3) I would point out that, apart from advantages of shade, of fodder, and of attracting rainfall, the plantation of timber on a system is most profitable if the right kind of timber

* Proposals for reserving them as such were submitted in my No. 65, dated 27th March 1883, to Senior Secretary to Financial Commissioner.

is planted. Nothing pays like kíkar and farásh, and the former also affords fodder; moreover both grow in poor soil, and it is only poor soil which can be bought at a bargain. The shísham is not a paying tree generally, and it affords no fodder. The ním and bakáín afford good shade; but the siris, though a quick grower, is not a tree which in any way pays to plant. Kíkar plantations will, in the course of twelve or fifteen years, pay off the entire initial cost of the purchase of their sites and of providing their irrigation arrangements, and all the net proceeds afterwards are pure profit. No doubt, under existing rules, all the proceeds of arboriculture have to be credited to Provincial Funds; but it is probable that if any district will send up a definite scheme of an arboricultural department—showing what it hopes to realize by cutting out, lopping and pruning, and the sale of fallen trees, and how it would propose to apply this income in the development of arboriculture, in supplement of what can be afforded for that purpose by the District Funds—permission will be given to retain such income for that purpose.

(4) What is required is that Deputy Commissioners should take up this matter of arboriculture on a regular method, and endeavour to create valuable properties, the produce of which shall permit of the continual extension of the system. What I myself did when I took up this matter in 1875-76 was to frame a list, with sketch map, of all existing avenues, groves, or plots of Government land (such as encamping-grounds) capable of being planted as groves; with a supplementary memorandum showing any patch of land that I had seen or heard of which might possibly be advantageously bought, and which was suitable for arboricultural purposes. The condition of these avenues, groves, &c., and the measures of improvement required for them, were noted, and operations were gradually undertaken in that sense. An establishment was formed, of an active daroga, assisted by jamadárs, for supervision of the bhistís, to whom lengths of new avenues were allotted, and of the málís, to whom were assigned new groves. Mature trees were everywhere marked, and sold by auction, standing, in the winter. Purchase of land and construction of wells or other irrigation arrangements proceeded gradually as opportunity offered and funds accrued. Each Tahsíldár supervised these operations in his own tahsíl, and the Deputy Commissioner in the course of his constant tours kept all up to the mark. In addition to these planting operations, much was achieved by the sowing of kíkar seed broadcast on the spoil-banks and embankments of the canals which were then constructed, and in planting farásh stakes on silt-banks, built up by backwaters in front of dams, or in depressions constantly occupied by standing water. The development attained by these operations may be seen in the report of Babu Myá Dás, Extra Assistant Commissioner (to whom I latterly made this department over), at page 33 of the Arboriculture Report of 1881-82. Over 45,000 trees were planted in Fírozpur in that year, or very greatly more than in any other district of the Punjab. Nor is this the result of any peculiar facilities existing in Fírozpur save such as have been created on the spot; nor, latterly, of any particular exertions—such operations, where once fairly started, proceed automatically.

4.—HISSAR DISTRICT.

General Remarks.—The year was, on the whole, an unfavorable one for arboriculture owing to the partial failure of the summer rains. The difficulties attending arboriculture in the dry parts of this district were noted in last year's report. It was then stated that a more systematic method of work would be initiated. Accordingly, in the past year one road and two nurseries in Hissar were selected for special attention. The road was that which runs from Hánsi to Bhiwáni, the first twelve miles of which are favorably circumstanced for arboriculture. Great efforts were made to extend and improve the nurseries of trees at Hissar, and have been attended with considerable success.

The lopping of trees was effected at and near the sadar by the málís attached to the gardens and plantations; and similarly at Hánsi. In all places it was done carefully and under the supervision of Tahsíldárs.

These remarks contain an answer to Conservator's circular No. 15, dated 9th May 1883, to address of Commissioner, Hissar (received under cover of Commissioner's circular No. 54, dated 11th May 1883).

The new trees planted in roadside avenues were chiefly shísham; but in the nurseries a large number of túm, ním and mulberry trees were put down, which will be planted out in the ensuing rainy season. In the very dry parts the kíkar is the only tree that stands a chance of survival.

Description of Work: Avenues.—Although the statement shows no extensions to existing avenues, the fact is that some of these avenues were so sparsely planted as hardly to deserve that name. The twelve miles of road from Hánsi towards Bhiwáni was the subject of special attention, and 2,826 new trees were planted on this line. A small avenue was also

planted on the road from Fatahabad towards Hissar. On the other roads efforts were confined to filling up the numerous and extensive gaps. This work will be continued in the current year; and, in my opinion, no extensions should be undertaken until all the so-called avenues now existing are properly filled up. In last year's report it was explained that very little can be done in the tahsíls of Bhiwáni, Barwála and Fatahabad. In parts of Hissar and Hánsi there are better prospects of success.

Groves, nurseries and plantations.—Previous to 1881-82 there were practically no nurseries at the sadar station. In addition to the regular Government garden, which is chiefly devoted to fruits and flowers, two nurseries have now been formed. The Park has been greatly improved, and about 2,000 fruit-trees and other trees of superior kinds have been planted. This place will, in a few years with proper attention, become a valuable plantation and nursery for the finer kinds of trees and shrubs. The other nursery near the dák-bungalow is devoted exclusively to growing forest-trees. It has flourished greatly, and will be of great value in future years as a source of supply to roadside avenues. The trees planted on the site where the annual cattle-fairs are held, have thriven, and more have been added. The plantations at Hánsi have received due attention.

The following table shows the number of trees existing at the commencement of the year, and the additions made:—

	Roads	*Plantations and nurseries*	*Gardens*
Number of trees existing from previous years ...	19,400	7,416	3,800
Number of trees planted ...	4,450	6,500	200
Number that failed ...	1,440	980	20
Total additions ...	3,010	5,520	180
Total trees now existing ...	22,410	12,936	3,980
Percentage of success ...	67·64	84·92	90·0

The percentage of survivals is good, and shows that care was taken of the young trees.

Establishment and Supervision.—The establishment was the same as in 1881-82. The supervising agency was also the same.

Financial results.—The financial results show an improvement on the preceding year. The receipts amounted to Rs. 398 against Rs. 287 in the preceding year, and the charges amounted to Rs. 4,000 against Rs. 4,662 in the preceding year.

The detail of receipts and charges was as follows:—

Receipts.	Rs.
Sale of wood, loppings and fallen trees ...	311
„ grass	87
Total ...	398
Charges.	
Establishment	2,845
Irrigation dues	204
Feed and keep of bullocks	533
Purchase of seed, and planting operations ...	236
Miscellaneous	182
Total ...	4,000
Deficit ...	3,602

5.—ROHTAK DISTRICT.

General Remarks.—There have been no particular events to record in the year under report affecting arboriculture in this district, except that in the Jhajjar, Sampla and Rohtak tahsíls some of the trees were destroyed by rats and white-ants, and in Gohána hundreds of trees were blown down by storms. The new trees planted have been carefully looked after, and are thriving. As I have impressed on Tahsíldárs, it is better to succeed with ten trees than to plant a hundred and leave them to perish afterwards for want of water. The bhistís all use pakháls and oxen, as in many places the water is at a distance from the trees to which it has to be supplied.

Description of Work: Rohtak-Kharkhaudá road.—This road is 18 miles in length, of which one mile in the Rohtak tahsíl was planted during the year under report with 513 trees of the species noted in the annexed statement, out of which 99 per cent. were successful.

Jhajjar-Bhiwáni Road.—Length of road in the Jhajjar tahsíl 6 miles, of which 3 miles were planted in previous years and 3 miles in the year under report. 750 trees were planted during the year under report, as per detail below :—

Newly planted	....	...	722
In place of those that died	...	...	28
			——750

Jhajjar-Kharkhaudá road.—1½ mile of this road was planted during the year under report with 260 trees, of which 85 were successful.

Sampla-Beri road.—During the year under report 266 trees were planted on 1½ mile of this road, of which 10 died.

The work of the year on other roads, as shown in the statement, was confined to filling blanks only.

Lopping and pruning of trees.—The work of pruning is not carried on by any other persons but those specially appointed for the purpose, as stated in last year's report.

Trenches.—During the year under report, side-trenches were dug along the Rohtak-Gohána road for 2 miles in the Gohána tahsíl for supplying the trees with canal-water, which has done much good to the trees on this road.

Nurseries.—There are 6 nurseries in the district from which saplings are transplanted during the rainy season, and in the months of February and March, and which are sufficient for the requirements of the district: 2 nurseries are at sadar, 1 at Gohána, and 3 at Jhajjar.

To prevent the saplings from being eaten up by cattle, fences of thorns are made round them. During cold weather, when necessary, protection from frost has been afforded.

An experiment based on the principles advocated by Mr. Down, of cutting the roots of trees into 4-inch pieces and inserting them into beds of earth, was made in the Rohtak tahsíl, but it did not meet with success. The roots did thrive well, but, when transplanted, dried up.

Establishment and Supervision.—The following establishments were maintained for arboricultural purposes :—

1 Jamadár
45 Málís
51 Bhistís

The Tahsíldárs and Náib-Tahsíldárs, when moving about in their respective tahsíls, supervise the work of the establishment. The District Officers make periodical inspections, and, when on tour, I was glad to see there had been few failures, though much remains to be done.

Financial results.—The subjoined statement will show the income and expenditure :—

		Receipts.			
By sale of trees	...	...	...	Rs.	230
		Charges.			
Establishment	...	...	Rs.	4,989	5,295
Miscellaneous	...	...	„	306	
	Deficit	...	...		5,065

6.—SIRSA DISTRICT.

General Remarks.—During this year the rainfall was much less than that of the preceding year. It is also less than the average fall of five previous years, though in tahsíl Fázilka it slightly exceeds the average. In consequence no systematic plan of planting was carried out; and existing trees suffered.

Description of Work.—It does not appear that anything has been done towards the work of plantation, the operations of the year being chiefly confined to the filling up of gaps of roadside trees. Most of the saplings in groves and gardens were damaged by white-ants and dryness of season.

The trees were generally transplanted when they were 2½ or 3 feet high. In tahsíl Fázilka, where there was good rainfall, seeds were also sown in roadside gaps. Nearly half of those that germinated, however, were injured by white-ants.

There were no experimental sowings made during this year.

Nurseries.—In this district there are two nurseries for rearing trees. One of them is at Dhanur on the stream Ghaggar, 7 miles to the south-west of Sirsa, and the other is at Fázilka in the tahsíl compound. They generally rear and keep a good stock of trees, and supply almost all the trees required for roads.

There are some fruit-trees in these nurseries from which a small income is derived. At the end of the year it appears that there were 4,958 seedlings at Dhanur and 6,000 at Fázilka. The species chiefly sown are kíkar, nim, siris, shísham, pípal, guava and pomegranate.

The young trees on roadsides were fenced with thorns to prevent cattle trespassing on them. In winter they were protected from frost by grass coverings.

The trees indigenous to the soil of this district are kíkar and beri, and they are generally planted on roads. Nim trees are also planted to some extent, and, under favorable circumstances, grow well and quickly; but kíkar trees are the trees of the district, thrive well with little water, and are found everywhere in abundance. In tahsíl Fázilka siris and shísham are, however, sown; and, on the riverside especially, they thrive well.

The pruning and lopping of trees are carried on in this district by the regular establishment maintained for looking after and taking care of trees in each tahsíl.

This district is so dry, and the means of irrigation are so deficient, that no arboricultural operations can be carried on on a definite system. The opening out of the Fázilwah and Mubárikwah canals, and the Abohar branch of the Sirhind Canal in tahsíl Fázilka, however, will afford a good opportunity for planting there; and I propose to call the attention of the zamíndárs shortly, when visiting Fázilka, to this important work, for which they should receive encouragement. From the only opportunity I have yet had of seeing the effect of roadside planting,—along 60 miles of the Sirsa-Fázilka road—I should say that the cost is quite inadequate to the results, and I would strongly advocate the planting of groves of trees in the vicinity of village tanks as more profitable than attempting to keep up the roadside planting, under present conditions.

Establishment and Supervision.—The establishments for nurseries and for the maintenance of roadside trees are as follows:—

Nursery establishment.

	Rs.	A.	P.	
1 Málí at Rs. 6 per mensem	72	0	0	
1 Kúlí „ „ 5 „	60	0	0	
				132 0 0

Roadside trees establishments.

	Rs.	A.	P.	
1 Bhistí at Rs. 6 per mensem ...	72	0	0	
1 Kúlí „ „ 5 „ ...	60	0	0	
1 Bhistí for 11 months & 7 days at Rs. 1 ...	11	3	6	
1 „ 12 „ „ „ 4 ...	48	0	0	
5 Bhistís 12 „ „ „ 2 each	120	0	0	
				311 3 6
				443 3 6

The establishments detailed above are under the direct supervision of the Tahsíldárs. The work of supervision is also done by the tahsíl subordinates, when they, as well as the Tahsíldár, happen to go on duty into the interior of their tahsíls.

Financial results.—The net result of this year's operations in a financial point of view shows a deficit of Rs. 394-11, which in the preceding year was Rs. 519-6-11. The receipts and charges on this account are here detailed.

Receipts.

		Rs.	A.	P.		
(1)	Sale proceeds of dry and fallen trees, including loppings of trees	214	1	0		
(2)	Sale of fruits, &c., of the nursery trees at Fázilka	18	2	9		
(3)	Sale of fruits, &c., of the nursery trees at Dhanur	23	4	0		
					255	7 9

Charges.

(1)	Pay of nursery establishment as detailed above	132	0	0		
(2)	Rent for water-supply given in Dhanur nursery	60	0	0		
(3)	Feed of nursery garden well bullocks ...	35	0	0		
(4)	Cost of a pair of bullocks for working the nursery garden well at Fázilka ...	50	0	0		
(5)	Other contingencies connected with nurseries	40	1	0		
(6)	Pay of establishment for maintaining roadside trees as specified above ...	311	3	6		
(7)	Contingencies connected with the above ...	21	14	3		
					650	2 9
	Deficit ...				394	11 0

The receipts were credited to the District Fund, which was also debited with the charges incurred.

UMBALLA DIVISION.

Remarks by Commissioner.

Simla.—The Deputy Commissioner of Simla has not been in the habit of sending in reports, as the Simla forests lie within the Municipality; and as regards the small portions of road which lie in British territory, there is no money in the District Fund which could be applied to arboricultural purposes.

The Commissioner has, however, requested him to send in a report next year, as it will serve to keep the subject in view.

Umballa.—The only road which has been regularly planted is a quarter of a mile on the Umballa and Pihewa road, on which 80 per cent. failed. The Deputy Commissioner has been requested to explain the reason of this remarkable failure.

Practically all the work which has been done has been in filling up gaps in old avenues; the rough result is as follows:—

	Planted	*Failed*	*Receipts from lopping*	*Costs*	*Deficit*
Umballa	... 3,689	54 per cent.	Rs. 1,807	Rs. 2,438	Rs. 631
Ludhiána	... 3,696	(Not given)	„ 2,175	„ 4,000	„ 1,825

The Commissioner is inclined to think that a smaller number of trees more carefully planted and looked after would give a better result.

He has for a long time impressed upon Deputy Commissioners the necessity of careful lopping according to Mr. Baden Powell's printed instructions, and the matter is now receiving fair attention.

The Deputy Commissioners have not submitted the general sketch of the plan of proposed planting operations in each district referred to in paragraph 7 of the Lieutenant-Governor's review for the year 1881-82; it is presumed this is because there is little else to be done with the available money than to replace old trees, but it would perhaps be of use if a sample of the sort of thing required as a sketch were circulated for guidance.

Ludhiána.—The Commissioner agrees with the Deputy Commissioner that mulberries are most unsatisfactory trees except where intended for silkworms; they require regular watering, otherwise they die out in dry years, and do not grow to the size required for roadside trees.

Bakáín and siris are also unsatisfactory.

The Deputy Commissioner is endeavouring to introduce the general planting of fruit-trees by wealthy villagers.

As far as the Commissioner has had the opportunity of personal observation, there has been no planting for many years past on the Grand Trunk or Kálka road; but it is a question how far trees are desirable on the edge of the banks of raised metalled roads. On the berm they are most useful, and here the kíkar has managed to sow itself in all favorable localities; but it is not a good roadside tree, as it affords no shade.

7.—UMBALLA DISTRICT.

General Remarks.—The average rainfall of the year, excepting in Jagádhri tahsíl, is much below that of previous years; in other tahsíls of the district, especially in tahsíl Kharar, the rainfall is somewhat less than half of that in 1881-82: this failure of rain greatly affected the progress in the new plantation of the year under report.

Description of Work.—On ¼ mile of Umballa and Pihewa road 150 trees were planted, of which 50 failed. The percentage of successful plantation is 66.

3,689 trees were planted to fill up blanks on roads in the tahsíl as per accompanying statement. The total failure of trees was 1,694. The percentage of successful trees is 54·08.

604 matured trees of avenues have died during the year.

There are three nurseries along the Umballa and Pihewa road, and a fourth just outside the Umballa tahsíl.

There are no groves in this district.

Establishment and Supervision.—29 málís and 20 bhistís were employed during 1882-83 for maintenance of roadside trees. These málís prune trees strictly in accordance with the directions conveyed in Commissioner's circular No. 47, dated 16th February 1878, *i.e.*, the branches of full-grown trees are sawn off close to the stem, leaving no jagged arms; but great boughs 20 feet from the ground are not cut. The work is supervised by the Tahsíldárs, Náib-Tahsíldárs, tahsíl jamadárs, district overseers, and mistrís.

Financial results.—The following is a detail of the income and charges of arboricultural operations in this district for 1882-83:—

Receipts.

		Rs.	A.	P.
Sale proceeds of withered and fallen trees, including pruned branches	...	1,592	8	3
„ fruit	...	90	9	0
„ lac	...	124	0	0
Total receipts	...	1,807	1	3

Charges.

Pay of 15 málís at Rs. 5 each per mensem	...	900	0 0
„ 12 „ „ 4 „ „	...	576	0 0
„ 1 „ „ 7 „ „	...	84	0 0
„ 1 „ „ 6 „ „	...	72	0 0
„ 20 bhistís „ 5 „ „	for 7 months	700	0 0
Cost of maintenance of 4 nurseries	...	55	0 0
„ fencing and tools, &c., &c.	...	51	1 0
Total charges	...	2,438	1 0

showing a deficit of Rs. 630-15-9 against Rs. 1,120-7-8 in last year, which shows some improvement.

8.—LUDHIANA DISTRICT.

General Remarks.—23·9 inches was the fall of rain last year, which was about 4 inches less than that of the previous year, *viz.*, 28·3 inches. The annual average is 27·1 inches, so the rainfall during the year under report was about 3 inches below the annual average, and scarcely sufficient. The rain, however, fell at seasonable times, and was well distributed, and the consequence was ample harvests.

Avenues on roadsides.—1,683 new trees were planted in lieu of those destroyed, decayed or blown down on the 26 miles of Kálka road, and 1,012 trees on the road from Kotla to Ludhiána, a distance of 17½ miles.

On the 22 miles of road from Sidhwán to Bassian 1,351 young trees were planted to replace those destroyed; and 91 new trees on the Samrála to Machiwára road, a distance of 6 miles; and on the Samrála to Khanná road 571 trees, replacing those destroyed.

Lopping.—Lopping is carried on in December, when the lower branches up to the height of 10 feet from the ground are cleared by means of a saw, which prevents fractures.

The lopping is done under the supervision of skilled gardeners sent out from the sadar and accompanied by the road overseer.

Nurseries.—Young trees are transplanted during the months of July and February from three nurseries in the district—one at the sadar, another at Bassian, and the third at Machiwára—which are quite sufficient for this district. There are no other plantations on Government land or of zamíndárs on Bet land.

Establishment and Supervision—consisting of 75 bhistís for watering trees newly planted, &c., at Rs. 4 each; 10 mates at Rs. 5, Rs. 6 and Rs. 7 each per mensem, who are in charge of gangs of beldárs supervised by sub-overseers at each tahsíl; the head overseer at the sadar exercising general control over all.

Cost of maintenance, including transplanting, Rs. 4,000.

Financial results.—The income of the year from sale of old trees and lopping was Rs. 2,175 against Rs. 2,150 of last year. This income, deducted from the Rs. 4,000 spent, leaves a balance of Rs. 1,825 net expenditure. It is satisfactory to note that the income has furnished over 50 per cent., or more than half of the expenditure.

		Rs.
Receipts	...	2,175
Charges	...	4,000
Deficit	...	1,825

Efforts are being made, by cultivating nurseries of fruit-trees at tahsíl headquarters and distributing them gratis, to induce better class villagers to cultivate fruit-trees of the hardy and useful sorts, such as limes, oranges, pomegranates. The Bassian garden contains a large stock, and has proved most useful to the Canal Department, which has been supplied with hundreds of forest and fruit trees from this nursery.

The subject of the dying out of mature trees in avenues and groves, suggested in paragraph 3 of the Conservator of Forests' circular No. 15 of 19th May 1883, to the Commissioner, has received attention. I have remarked that the trees which mostly die out after reaching maturity are the siris, the bakáín, and the mulberry; hardier trees like the shísham, jáman, phulái, &c., do not die out, but attain a great age, although maturing slowly. In the earlier days of tree-planting, trees such as siris, bakáín, &c., were found to be quick-growing trees which give an effect and shade in a short time. Shísham grows well and thrives in the soil of this district, so we replace the dead trees mostly with shísham. The jáman is an excellent fruit-bearing and evergreen tree, but it is very slow growing and delicate in the early stage, requiring good soil and a great deal of moisture.

I have always adopted for many years a plan for planting new trees which I have found very useful. It is also most useful in transplanting large trees. A round hole is dug in the ground about 4 feet deep by 3 feet in diameter, and filled with water, and when that is drying the tree is put in.

The consequence is that a supply of moisture is secured at the roots which months of top-watering might not secure.

The Canal Department is beyond doubt giving a great impetus to arboriculture. Their own plantations will be on a very large scale, and it is very right too that they should take early measures to supply a deficiency caused by themselves. The immense consumption of wood and charcoal on their works has, beyond doubt, greatly denuded those districts through which the canal passes of fuel and timber; but a few years of persistent attention to arboriculture on canal banks will work wonders. I think some legislation is necessary in aid of the inculcation of arboriculture. The agriculturist population are mere children in matters of system or forethought. We must not forget, too, that practically Government is the landlord, and the proprietors but permanent tenants; and they are so malleable and

ready to accept Governmental action that it is a matter to me of great regret to see that in such vital questions as sanitation, supply of drinking-water, arboriculture, roads, vaccination, a greater initiative is not taken, and the opportunity of a new settlement seized, to introduce improvements in village administration, simply by arrangement with proprietors to make the necessary entries in the Wájib-ul-Arz, or administration paper.

9.—SIMLA DISTRICT—*Nil.*

JULLUNDUR DIVISION.

Remarks by Commissioner.

The only event during the year specially affecting arboriculture was apparently the scantiness of the rainfall, which was below the average, and, in consequence of which deficiency, the season was not, it is generally said, so favorable for arboricultural operations as that of the year before. Indeed, excepting the Kángra District, where the rains in July and August were most opportune, there was little new work undertaken in the Division. Still, so far as the operations went, good work appears to have been done; and now that interest has been generally aroused in the subject, and the importance of extending nurseries has been impressed upon, and seems to be recognized by, District Officers, greater progress may be yearly looked for in the future.

Jullundur.—The actual work done in the Jullundur District again consisted chiefly in filling up gaps and blanks in existing avenues, for of new avenues only 6 miles were planted, *viz.*, 2 miles on the road from Jullundur to Tánda and 4 miles on that from Phillour to Samrai. The total number (7,668) of trees planted on roadsides was, however, much larger than in the preceding year, and a considerable percentage is reported to have succeeded—so much as 90 per cent. on the first mentioned road. The trees were, as usual, chiefly shísham.

There was no change in the number of plantations, of which there were 46; while, as regards nurseries, that at the sadar station is reported to have proved an efficient source of supply, no less than 3,410 trees having been taken therefrom, of which 895 were given gratis to zamíndárs, whose services are being enlisted in the cause in the Jullundur and Kángra Districts, and who are doubtless beginning gradually to appreciate the advantages of arboriculture.

Hoshiárpur.—In the Hoshiárpur District, too, so far as avenues were concerned, their maintenance and the filling up of gaps seem to have constituted the work of the year; 13¼ miles of new avenues were, however, planted as compared with only 7½ miles in the year before, the number of trees put down having been 15,809. The total number of miles of avenues thus now existing in this district is 277. Besides this, 35 acres 1 rood and 30 poles of the area of the encamping-grounds in the district were planted out with 960 trees. 201 trees were also put down in the various public gardens. Also the operations for the reclamation of the *Chos* were continued, and nearly 10 acres of additional land were planted over with múnj grass and nara. And a good deal was again done in the way of putting down múnj grass, nara and kabi for the purpose of protecting roadway embankments, in the extension of various kinds of trees, and in the cultivation of the several varieties of *eucalyptus.*

Kángra.—In the Kángra District no less than 50½ miles of avenues were planted, thus:—

1 mile in each of the tahsíls of Núrpur, Kángra and Dera;
37 miles on various roads in the Hamírpur tahsíl;
9½ „ „ „ Pálampur „ and
1 mile in the Kulu sub-division.

And altogether the large number of 47,379 trees are reported to have been planted out, of which rather more than 50 per cent. apparently succeeded. They were, as usual, chiefly tún, shísham, mango, mulberry and jáman. The total number of miles of avenues now in this district is 391½, the length of road remaining unplanted being 238¾ miles. The subject of nurseries continued to receive attention, and, although some are said to have been given up in a few tahsíls, the number and area of those at Dharmsála were considerably improved.

The matter of trimming and pruning trees also appears to have been kept in view in all three districts, though in some of the tahsíls of the Jullundur and Kángra Districts the lopping of branches had, for want of funds, which it is hoped may be gradually forthcoming, to be effected by means of untrained agency.

The establishment in the Jullundur and Hoshiárpur Districts consisted, in the former of 1 daroga, 6 peons, 1 gardener and 14 kúlís, or 10 kúlís more than in the previous year, besides a kúlí temporarily engaged to look after the trees on the Dolike-Sundarpur drain; and in the latter of 3 jamadárs and 97 málís and kúlís, who were supervised by 3 overseers, being 1 jamadár and 1 overseer less, but 5 kúlís more, than in 1881-82. The increase in the strength of the establishment of the former district was necessitated by the establishment of the new nurseries referred to in last year's report. The Deputy Commissioner of Kángra has again given no details, but the expenditure (Rs. 191) was apparently much the same as in the year before.

The receipts in the several districts were :—

Jullundur	...	Rs.	4,281	as compared with	Rs.	4,084	in 1881-82.
Hoshiárpur	...	„	7,714	„	„	6,461	„
Kángra	...	„	296	„	„	250	„

and the charges :—

Jullundur	...	„	3,069	against	„	1,624	„
Hoshiárpur	...	„	6,004	„	„	6,228	„
Kángra	...	„	2,472	„	„	650	„

Thus there was a deficit again only in the Kángra District to the large extent of Rs. 2,176, while in the other two districts, not only was there a surplus of Rs. 1,212 in Jullundur and Rs. 1,710 in Hoshiárpur, but the receipts exceeded those of the previous year.

In conclusion, the Commissioner regrets the delay in the submission of this report, due to the large number of reports in course of preparation in his office which prevented this one from being taken in hand earlier.

10.—JULLUNDUR DISTRICT.

General Remarks.—No event specially affecting arboriculture occurred last year.

Description of Work: Road from Jullundur to Tánda.—This road is 19 miles long, of which 7½ miles were planted in previous years and 2 miles during the year under report; the remaining miles, though planted in former years, have failed, and will in part be replanted next season. Of the trees planted on this road 90 per cent. were successful, and are now in good condition.

Road from Phillour to Samrai viâ Rurka.—The length of this road is 15 miles: 4 miles were planted in previous years and 4 miles during the year. 1,200 trees were planted; nearly all were successful and are in a flourishing condition.

The work of the year on other roads, as shown in the statement, was filling gaps and blanks.

The total number of trees planted during the year on roadsides was 7,668.

The two roads above mentioned are the principal roads in the Jullundur and Phillour parganas, and the operation of tree-planting has been mostly confined to these since 1881-82. As the metalling of the Tánda road has been finished, work will be continued on in future years till the whole road be planted. Similarly in the case of the road from Phillour to Samrai. In other tahsíls the plan of limiting operation to particular roads till they are finished is being followed. This appears preferable to scattering the establishments over various localities, the results of which cannot be easily tested by the District Officer.

The shísham is generally planted in this district, both on account of its shade and value of timber; the kíkar is also planted. The soil of Jullundur is favorable to the growth of these two kinds of tree.

Lopping of overhanging branches only was done during the year, in tahsíl Jullundur by *naukar* kúlís, and in other tahsíls by a temporary establishment under the supervision of Deputy Superintendents. The instructions on this subject issued by the Commissioner in 1879 are always acted upon. The transplants are of a height of not less than 3 feet.

Plantations.—There are 23 Government plantations on the banks of the Sutlej—8 in Phillour, 14 in Nakodar, and 1 in Nawashahr tahsíl.

Nurseries.—The Jullundur sadar nursery supplied 3,410 trees during the year, of which 2,274 were planted on district roadsides, 895 given to zamíndárs free of cost, and 241 to the Military authorities for planting on cantonment roads.

Mention was made in the last year's report of the establishment of 8 additional nurseries at suitable spots on the principal roads. These have now been entered in the statement, as the total expenditure was incurred during the year. Arrangements have also been made in the current year for establishing 9 more nurseries. Thus gradually grounds for supplying trees will be on all the principal roads at easy distances.

Establishment and Supervision.—The district arboriculture establishment has been as follows :—

1 Daroga at Rs. 15 per mensem 6 Peons „ 4 each „	}	To watch plantations on the riverside.
1 Gardener „ 10 „ 4 Kúlís „ 4 „ „	}	Jullundur sadar nursery.
10 „ „ 4-8 „ „		...For new nurseries.

A kúlí at Rs. 4-8 was temporarily employed for looking after trees and grass planted on the Dolike-Sundarpur drain.

Naukar kúlís were employed on metalled roads on the work of planting trees as well as looking after avenues. Temporary establishment was specially entertained last spring for planting trees on roadsides in the different tahsíls, and in the hot weather extra bhistís were kept in the Jullundur and Nawashahr tahsíls.

Financial results.—

Receipts.	Rs.
Sale of wood and grass on roadsides ...	3,040
„ of plantations	846
Sale of fruit and vegetables of Jullundur sadar nursery garden	395
Total ...	4,281
Charges.	
Pay of fixed arboriculture establishment, and contingencies	995
Plantation of nurseries on roadsides (including establishment)	1,346
Maintenance of trees on roadsides ... 128 Planting „ ... 600	728
Total ...	3,069
Surplus ...	1,212

11.—HOSHIARPUR DISTRICT.

General Remarks.—The season, on the whole, was unfavorable for tree-planting, the rainfall being nearly 14 inches below the average.

Very little new work has to be recorded, the energies of the establishment being mostly directed (owing to deficient rainfall) to maintenance of existing avenues and attempts to make good failures of previous years.

A great deal has been done in this matter. Useless dead trees, or those kinds which are generally prescribed as being unfit for avenues, have been, to a great extent, removed from the roadsides, the result being that in many places the avenues look ragged, and unsightly gaps are to be noticed, which, however, will soon be filled up by the more valuable saplings now put down.

Pruning and lopping.—Attention has been devoted towards instructing the establishment in this very important part of their work, and, with regard to circular No. 15, dated 9th May 1883, from Conservator of Forests, Punjab, to Commissioner, Jullundur Division, it may be as well to state that no pruning or removal of branches from any tree, large or small, is permitted except under the direct supervision of overseers or jamadárs, who are fully aware of the importance of avoiding measures which would lead to the permanent disfigurement of any tree by reckless or injudicious hacking. Every time a branch or frond is removed, the manipulator should endeavour to exhibit what the Faculty of Medicine term a *clean stump*, in order to allow the bark to grow over the severed limb as easily as possible.

Description of Work.—The progress has, on the whole, been fair. As stated in a former report, the avenues on the main road are rapidly approaching completion, and during the present season arrangements have been made to dispense with the usual temporary establishment as follows:—

Dasuya	...	...	...	7 men
Hoshiárpur	...	...	...	6 „
Garhshankar	...	...	...	6 „

The saving to be effected will amount to Rs. 228.

Experimental sowing.—In a previous report attempts were made to introduce and more generally extend the following kinds of trees: *Bassia latifolia, Ulmus integrifolia, Patagonia Roxburghii, Artocarpus integrifolia;* these are now being planted out in the avenues, and seem well suited to the natural condition of soil and climate of this district.

The *eucalypti*, chiefly *E. Tereticornis*, on the whole are doing well in many places; however, young trees are slow to develop girth, exhibiting an elongated attenuated growth far from symmetrical, consequently hideous to behold; a remedy for this was found in *palarding* them; about ten feet of the stem has been left standing; a vigorous lateral growth, accompanied by a perceptible increase in girth, has been the result. The specimens of *Eucalyptus globulus* planted some few years ago have not done well. The *Eucalyptus goniocalyx* seems delicate, and suffers from the extreme high temperature of May and June. The Jaswan Dun, particularly about Amb and Una, are the localities best suited for *eucalyptus;* in course of time, when the value of this tree becomes more fully recognized, we may reasonably expect to see its cultivation extended by the people themselves.

It may be added that last year some seeds of *eucalyptus* scantlings were procured from the Holta tea plantation. These were cut from trees only fourteen years old; each log supplied two lengths 6″ × 4″ of good sound heart-wood, which were used for trusses in roofing a workshop 20′ span.

The attempts alluded to in last year's report to protect the city of Hoshiárpur from the action of the *cho* met with a fair measure of success. The experiment was again continued this year, the failures of previous seasons made good, and an additional area of nearly 10 acres planted out with nara (*Malva Parriflora*) and múnj (*Saccharum sárá*). On the new hill road from Phagwára to Mandi now open for traffic, a good many of the slopes and embankments above and below the road were planted out with baggar (*Andropogon Involutum*), kahi (*S. spontaneum*) and baru (*Sorghum Halpense*). These grasses are endued with wonderful vitality, and the manner they grow and flourish on the dry denuded *kols* and rivers of these low parched arid hills is truly surprising; their great importance in preventing slips and consolidating slopes both in excavation and embankment cannot be over-estimated.

The total mileage of the roads in this district amounts to 438 miles; of this length 277 are planted up. This is an increase over last year of 14 miles.

The following tabular statement shows the number of trees said to have been planted out during the year under review:—

	Roads	Encamping-grounds	Gardens
Number of trees planted in previous years	122,755	23,824	11,597
„ „ in 1882-83	15,809	960	201
Total ...	138,564	24,784	11,798
Number of trees that failed during the year of the total planted ...	9,217	3,744	243
„ „ now standing	129,347	21,040	11,555

Encamping-grounds.—Of the 14 encamping-grounds with a total area of 479 acres 2 roods 8 poles, 399 acres 2 roods 33 poles are planted out; this is an increase of 33 acres 1 rood 3 poles brought under trees during the year under review.

Establishment and Supervision.—The establishment employed during 1882-83 consisted of 3 jamadárs and 97 málís, distributed as follows:—

Hoshiárpur—

1 Jamadár at Rs. 7 per mensem.
23 Málís „ 4 each „

Garhshankar—

1 Jamadár at Rs. 7 per mensem.
22 Málís „ 4 „ each

Dasuya—

1 Jamadár at Rs. 7 per mensem.
13 Málís „ 5 „ each
9 „ „ 4-8 „ „
3 „ „ 4 „ „

Una including Amb—

1 Málí at Rs. 6 per mensem.
1 „ „ 5 „
19 „ „ 4 „ each
1 „ „ 2 „ „

This includes the málís, 21 in number, employed on the encamping-grounds and station roads.

Supervision was maintained by 3 overseers and the Tahsíldárs, who have all displayed an intelligent interest in the work. In Hoshiárpur especially Tahsíldár Muhammad Ali Shah deserves credit for his energy and the assistance he has on all occasions offered. General supervision is efficiently maintained by Mr. Faddy, District Engineer.

Financial results.—

Receipts.

		Rs.
By sale of timber	...	4,744
„ fruits	...	129
„ khar káná	...	109
„ lac	...	717
„ grass	...	247
Total	...	5,946

Charges.

Establishment	...	4,830
Extra do.	...	875
Contingencies	...	299
Total	...	6,004
Deficit	...	58

The amount realized from encamping-grounds, which has hitherto been credited to Provincial Funds, amounts to Rs. 1,768, as per following statement :—

		Rs.
By farming land	...	1,280
„ sale of timber	...	349
„ „ grass	...	139
Total	...	1,768

and the income from both sources amounts to Rs. 7,714, showing an increase over last year's revenue of Rs. 1,273 and a clear profit on the year's transactions.

12.—KANGRA DISTRICT.

General Remarks.—The rainfall throughout was on an average less than in the previous year, but the diminution did not have any appreciably injurious effect on the arboriculture operations, as the amount of the rain which fell in July and August, when trees are usually planted, was sufficient for the purpose, and no loss accrued in consequence. The drought, however, which occurred in the two preceding months had an unfavorable effect on the trees planted in parts inaccessible to artificial irrigation. Endeavours were made to provide for water by the entertainment of bhistís, but the nature of the country, and the necessarily limited resources at disposal, render it impossible to make these measures so thorough as to prevent all possibility of loss by drought. But in such parts the plan followed is that the plantings are only confined to trees of such a description as take easy growth and need but little water.

The Assistant Commissioner of Kulu does not assign any cause for the large loss of trees planted in his sub-division, but I attribute it to the abnormal fall of snow which remained on and covered the ground for many weeks in the cold months.

The cold-weather rains during the year were favorable to arboriculture.

Description of Work.—The number of roadside trees planted in all the tahsíls was 47,379, as compared with 26,386 in the previous year, *viz.*—

			Successfully.
(1)	Núrpur	896	62 per cent.
(2)	Kángra	1,464	54 „
(3)	Pálampur	5,409	80 „
(4)	Hamirpur	28,282	75 „
(5)	Dera	2,865	78 „
(6)	Kulu	8,461	20 „

The percentage successfully planted was as is given above. But I would point out that the percentage has been deduced from the condition of the trees as it was reported to be at the close of the year, and that they have yet to stand the drought which will ensue in the two succeeding months, and which ordinarily destroys more than half the number of trees planted from year to year.

The description of the trees planted in the various tahsíls has been given in the statement. The nurseries have, on the whole, been improved, although some have been given up in one or two tahsíls, as other means were found to exist for supplying young plants.

In Dharmsála there have been large additions, and it is chiefly to the new nurseries established in this place that the aggregate area of nurseries for the pargana has been increased from 1 acre 2 roods at the commencement of the year to 9 acres 1 rood.

Kelú seedlings have been largely planted in the elevated portions of the Dharmsála forests and have thrived well, and will, it is anticipated, prove the means of reproduction in these forests, which have suffered considerably from the constant drain on them.

In Narwánáh, Jandrangal and Chari the nurseries consist of mango, tún, khirk seedlings, and mulberry cuttings.

The mulberry cuttings planted in the Núrpur iláká have been increased and improved, especially by means of a garden in which the Chinese variety has been successfully planted, and which will be very useful for supplying cuttings for sericulture purposes.

New nurseries of shísham, mulberry, tún, jáman, &c., have been established in the Hamirpur iláká along the Mandi and Phagwára line of communication recently completed and opened.

Two of the plantations started in Dharmsála are doing well, and contain khirk and simbal (cotton-tree) seedlings which have been successfully transplanted.

Establishment and Supervision.—There is no regular establishment, and the work is done by kúlís temporarily employed under the supervision of the Kotwáls and Tahsíldárs. In Dharmsála two gardeners on Rs. 5 each and one rákhá on Rs. 5 are entertained, and an allowance of Rs. 10 given to the Kotwál for supervision.

Lachhmí Sahái, Tahsíldár of Hamirpur, continues to take a praiseworthy interest in the matter, as the statistical results of the operations as conducted in his iláká prove.

The instructions received from time to time as regards the planting and lopping of trees are communicated and explained to the several Tahsíldárs and Kotwáls.

I am sorry the funds at the disposal of the Committee do not admit of the entertainment of any trained agency for the lopping of roadside trees in all the tahsíls; and in some places it has to be effected through ignorant kúlís to the detriment of the trees, as my own experience in a few instances, as well as the reports of some of the Tahsíldárs, show. However, the matter has been brought to the notice of the District Committee, and I hope soon to be able to provide málís for the tahsíls in which no other satisfactory arrangements can be made for the purpose.

Financial results.—The expenditure was—

Establishment, permanent and temporary	Rs.	191
Nurseries, and expenditure on procuring seedlings, &c. ...	„	1,201
On roadside trees	„	1,080
Total ...		2,472

The receipts from sale of old trees and loppings was Rs. 296, which shows a deficit of Rs. 2,176; as against an expenditure of Rs. 650 and an income of Rs. 250, or a deficit of Rs. 400, for the previous year. The increase in expenditure is due to the unusually larger number of trees planted along roadsides.

I have visited every single part of my district, Kángra proper, in the year under report, and am glad to be able to state that the experiment resolved upon in the District Committee, of giving the Tahsíldárs each two miles of roadway to commence upon, has been a great success; indeed, I may say I am much pleased with the interest and energy displayed by all the Tahsíldárs generally in this matter during the past year, and confidently report that a vast improvement has been made.

AMRITSAR DIVISION.

Remarks by Commissioner.

Roadside avenue planting has been carried on for so many years that, in the Gurdáspur and Siálkot Districts at any rate, little now remains to be done, except to replace trees that have been destroyed by storms, or have died from various causes.

As stated in a previous report, Commissioner thinks the time has come when increased attention should be paid by District Officers to the introduction of fruit-trees into villages.

An improved system of management has been introduced into the Gurdáspur District by Colonel Harcourt, which will, it is hoped, produce good results. It must not be supposed, however, from his remarks that arboriculture is in a backward state, or has been unattended to in past years. Roadside avenues are more continuous, finer and more abundant in this district than in any other with which Commissioner is acquainted.

Commissioner entirely concurs with the Deputy Commissioner, Gurdáspur, in his remarks on transplanting trees. Much money and time are often wasted by planting small seedlings in small holes and then carefully excluding them from light and air by erecting a mud-wall round them, covering it over with a dense heap of thorns. The energetic Tahsíldár can point triumphantly to his thousands of newly-planted trees; but as they are all doomed to die in the course of the year, and have to be renewed annually a few weeks before the Deputy Commissioner's cold-weather tour, no real progress is made.

Commissioner's experience as Deputy Commissioner of Delhi was, that by transplanting large well-grown saplings, with plenty of root round them (not chopped off according to the approved native plan, as if you were making the handle of a walking-stick) in wide holes filled with soft earth—at the end of a couple of years the transplanted saplings looked like trees of ten years' growth.

Increased attention appears to be paid year to year on the annual lopping of trees, but much still remains to be done by District Officers in this direction. Thousands of trees are annually ruined and their early decay made inevitable by inattention to this matter. The way branches are still hacked and torn from their parent stems is quite heartrending to see.

13.—AMRITSAR DISTRICT.

General Remarks.—I think a few simple rules, carefully drawn up and distributed to every zail, thána and tahsíl, would foster arboriculture. If the rules are long and badly printed and difficult to understand, no one will read them; if clear, simple and convincing, a large percentage of those who get hold of the pamphlet will, probably, be interested and do something. Many Tahsíldárs will always remain uninterested, and do nothing. The "shauk" is wanting. Several will let their enthusiasm outstep discretion, and plant hundreds of trees in places where 100 per cent. will die within six months.

It is to obviate these difficulties that I make the suggestion that a few simple rules should be distributed as above noted; not only so, but that this supply of pamphlets should be re-distributed annually for some five years.

The following suggestions, among others, might be entered in the pamphlet: Indigenous trees should be planted round every tahsíl, thána, dispensary and other public buildings. Where District Funds could afford it, a small allowance of Rs. 3 or Rs. 4 per mensem should be given to a bhistí to water the trees. Where a monthly expenditure cannot be allowed, kíkar and farásh might be planted in trenches similarly, on roadsides. Every tree should be planted at a distance of 30 feet. This seems a waste of space, but look at avenues where this rule has been attended to and where it has not; in the former case trees are large

and handsome, because they have room to throw out branches on each side; in the latter, the general run is distorted and lopsided trees. This cannot be remedied in after-growth.

Each zaildár should be encouraged to tell villagers interested to plant pípal and other trees round villages and near wells and tanks, and in accordance with his success a "Parwána khushnúdí" should be given. He would be asked to give a return yearly as to number of trees planted. Similarly, all local heads of thánas, tahsíls and dispensaries should be asked for a yearly return. The Superintendent of Police should be asked to interest himself as far as his thánas go.

For the paid establishment, each málí or bhistí should have charge of as many trees as he can water in six days, *i.e.*, he should water one-sixth of the number in his charge daily, and, in submitting his bill, should bring with it a certificate from the Tahsíldár or daroga that the trees in his charge were all thriving. If there was any falling-off he should be cut, and know for the future that his pay would depend on his own exertions.

A description of the most approved sort of fence-work round trees should be shown.

The best way of sowing kíkar and farásh in inhospitable regions should be described.

Much of this is already shown in Financial circulars, but this information does not go beyond Tahsíldárs, and to many of them with little effect, whereas the zaildár should be considered the unit. Deputy Inspectors are nowhere.

Tahsíldárs should be held responsible as regards all revenue buildings; Deputy Inspectors for all thánas and chaukís; zaildárs for villages, tanks and wells; regular establishment for roadsides.

14.—GURDASPUR DISTRICT.

General Remarks.—As already stated when forwarding to the Commissioner a copy of the minutes of the District Committee's meeting of 23rd December 1882, when I first took charge of the district in October last I found arboricultural arrangements in a very backward condition. In saying this it may be deemed that I tacitly would censure those who have preceded me as Deputy Commissioner of Gurdáspur, but I have no desire to do anything of the sort. With certain rules and regulations, most departments, even when left pretty well to themselves, do not fall into utter decay; but it is, I think, otherwise with arboriculture, which requires unceasing care and supervision of subordinates. With, however, a constant change of District Officers matters begin to go astray, and in this district there has been no permanent Deputy Commissioner for some years. The views of one officer do not always meet the acceptance of his successor, and officers in temporary charge of a district are exposed to side influences which materially affect the success of plans originated by those who are no longer in a position to control and guide. An officer coming new to a district is, to commence with, pretty well in the hands of his office people, and expenditure is often added to or curtailed when, with the light of greater experience, such changes could never have been sanctioned. Thus it is in this district that the frequent change of officers has interfered with the due development of arboriculture.

When I came here I found a large and expensive establishment scattered over miles of road, or on so-called gardens, working under no proper supervision, and, in fact, really doing nothing at all. Every road I traversed was much in the same state. The gaps in once stately avenues planted out by Colonel Davies, Colonel Becher and Mr. Naismyth were numerous, and these gaps were either unfilled, or such weedy saplings of a few inches in height had been inserted—these, too, without any protection from cattle or goats—that it was hopeless to expect within a measurable period anything like a return to the state of prosperity which must have prevailed some fifteen years ago.

But before taking action I carefully examined various lines of roads, and in no one instance could I find that anything like a consistent effort was being made, or had for a long time been made, to replenish where replenishment was required, or to protect where protection was an absolute necessity if the young trees were to come to maturity.

It was also the same with the various so-called groves and gardens. As an instance in point, I may mention a shísham grove just outside my house. The trees here are all some 25 feet in height, and I believe were planted by Mr. Burney eight years ago. A bhistí was then told off for these trees, and this man had been drawing his pay ever since, having nothing whatever to do for the last three or four seasons. And just as in this case so I found it elsewhere. There were useless establishments under no guiding hand, and certainly nine-tenths of the arboricultural establishment were drawing pay and doing positively nothing.

Then there were the district gardens. They abounded everywhere—they gave no profits, and they merely were kept up for the support of so-called gardeners and tree caretakers.

Description of Work.—I therefore, after careful consideration, drew up a new arboricultural scheme, which was approved of, and which has been in working order for the last 4½ months. A copy of my scheme is annexed, as the Conservator of Forests may desire to see it, and it will enable him the more readily to understand what is now being done.

When the new tahsíl gangs were formed, I had them all brought into the sadar, and for several mornings I personally instructed them as to how young saplings were to be put in the ground and how these could be properly protected. But one man in the gang, the jamadár, was ever to be allowed to lop branches, and the use of the axe in removing these last was absolutely forbidden; two saws being made over to each gang, with such other implements as were required.

Proper nurseries were ordered to be prepared in each tahsíl, and each Tahsíldár was instructed that under no circumstances were saplings under 3 feet in height ever to be planted out; and, what was of just as much importance, that planting-out was never to be attempted at all unless at the same time provision could be made for protecting the young shoots from cattle and goats. Tahsíldárs were moreover instructed to begin operations in a systematic manner, commencing with one road and completing its full strength of trees before sending the gangs elsewhere. As for the wretched specimens of young trees planted out here and there—most of them indeed dwarfed and stunted from years of neglect—I left these to take their chance. But as one road is restored to its former condition another one will be taken up, and all gaps will, I hope, in time be filled with healthy and vigorous young trees.

To commence with, I selected the following lines of communication which were first to be put into thorough arboricultural order:—

In tahsíl Gurdáspur: the Gurdáspur and Bahrámpur road.

In tahsíl Pathánkot: the Pathánkot and Sujánpur road.

In tahsíl Shakargarh: the Shakargarh and Kot Náina road.

In tahsíl Batála: the Batála and Anárkali road.

In every way I encourage the zamíndárs to come in and apply for cuttings of fruit-trees, and every application for saplings of every description from the gardens is met without delay. In addition, I was enabled, through the kindness of Dr. Henderson, who made up the parcels for me, to send out 1,000 young bamboos for distribution in clumps for village wells. We have a good nursery for mulberry trees near the Gurdáspur encamping-ground and cuttings are given gratis to all who apply for them.

Financial results.—The total expenditure for the year, including the pay of servants in the Government gardens, and in contingencies, comes to Rs. 5,524; and if this sum is properly dealt with, the results ought eventually to show well.

The lopping of the trees on the Trimmu and Shahgarí roads was done by daily labor, the hand-saw being used, and the work was carried on under the direct supervision of the tahsíl overseers. In the sadar station and on the Behrámpur road, lopping was effected to some extent by the establishment. On no other roads did loppings take place These loppings fetched Rs. 29-8.

Transplanting.—I have been trying experiments in transplanting trees 14 and 15 feet in height; these are taken with some 2 feet of mould on them; and, so far, I have succeeded in rearing them successfully, and, thus encouraged, I shall endeavour to plant out such trees in avenues further from the sadar.

I cannot say I am at all satisfied with the returns sent in, and I should like to see the column showing the number of trees planted out done away with. My experience is that these figures are nearly always quite unreliable.

Extract from Proceedings of the District Committee held at Gurdáspur on 23rd December 1882.

Read arboriculture scheme proposed by the President.

1. The present system of arboriculture may be termed no system at all. The establishment is enormous, and nothing is done.

I have been from Gurdáspur to Dera Nanak, and, though bhistís are kept for this road, there is not a young tree on this line that is looked after properly.

The same applies to the road from Gurdáspur to Bahrámpur, to the road from Batála tahsíl to the Barádári at Anárkali to the kachchá road from Gurdáspur to Dínanagar, to the road from Pathánkot to Sujánpur, and probably to every other road in the district. The

supervision has been absolutely *nil*, and the men appointed to look after the trees have done nothing. The want of system has much to do with this.

2. Actually Rs. 3,410* is expended on arboriculture in the district, and, go where I may, I see not the slightest trace of supervision or care.

3. The Tahsíldárs are one and all to blame; they have left their duty to others, and the result has been the state of affairs I now have to notice.

I have postponed taking action hitherto, partly because other matters engaged my attention, and partly because it was advisable to see for myself what the state of arboriculture in the district was.

4. As to the sadar station, a good deal might be said. I see nowhere the very slightest evidence of care or supervision. The young trees are not protected in any way, and those that have been put in are such wretched specimens that they must all be rooted up and destroyed. With the funds granted by the Committee very much might be done.

5. The first point is to at once dismiss the bhistís who have been appointed to look after miles of roads. These men when away from supervision do nothing. They will be taken on in the tahsíl staff, and the following orders are now issued and will take effect from 15th December 1882.

6. In each tahsíl there will be an arboriculture jamadár on Rs. 8 a month, and under this man there will be the following establishment:—

Tahsíl establishment.

	Rs.
Tahsíl jamadár at Rs. 8 per mensem	96
10 tree care-takers or bhistís at Rs. 5 per mensem ...	600
	696
For 4 tahsíls	×4
Total ...	2,784

The arrangements for the sadar station will be—

1 jamadár at Rs. 8	96
6 tree care-takers at Rs. 5 each	360
	456
Thus the total will be	3,240
Add pay of málí in nursery at dák-bungalow at Rs. 5 per mensem	60
„ increase of pay of málí of Session house garden ...	24
	3,324
Deduct	3,410
Balance	86

The 3 bhistís for the mulberry garden, at Rs. 15 per mensem, must be kept up =Rs. 180, for the present, though it may be that the sadar establishment can perfectly now see to this garden, and one of the station bhistís will daily work at the Kacheri enclosure.

7. Tahsíldárs will at once organize these establishments. The jamadár will be under the immediate orders of the district overseers, who will regularly report whether arboriculture operations are proceeding satisfactorily.

8. The Tahsíldár will see that every man, including the jamadár, is provided with a forked stick (which he will himself procure) in this form of about the length of 3 feet. To each tahsíl party there will be allowed two phauras and two axes.

Probably these are in store; if not, they will be provided.

9. The system the Tahsíldár will work on is as follows:—

A nursery will be at once formed in each tahsíl, in which mulberries, shísham, siris, jáman, and such like trees, will be grown. Tahsíldárs can select their own trees.

If these nurseries are in existence, the trees in them will be utilized. Each tahsíl has a garden, and these trees should be planted therein, a regular space being allotted for the same.

* Exclusive of pay of servants of Government gardens and arboriculture contingencies.

10. The nursery having been prepared, the Tahsíldár will then begin operations, and these rules are to be attended to—

(*a*) No sapling under a height of 3 feet is ever to be planted out.

(*b*) No sapling is ever to be planted out until provision can be made for its being protected from goats and cattle.

11. Tahsíldárs will begin operations on roads in systematic order. There is not a young tree in the district which seems worth looking after, so the care-takers may let these scattered young trees look after themselves.

In fact, the system of sending one or two men to permanently remain in out-of-the-way places is positively prohibited. The gangs will work together under the orders of their jamadárs.

The Tahsíldár, Gurdáspur, should first employ his gang on the Gurdáspur and Bahrámpur road.

The Tahsíldár of Pathánkot's gang will commence on the Pathánkot and Sujánpur road.

The Tahsíldár of Shakargarh's gang will work on the Shakargarh and Kot Náina road.

The Tahsíldár of Batála's gang will commence on the tahsíl of Batála and the Anárkali road.

12. The gangs will commence work—that is, when they can be spared from the nurseries, and perhaps they may not be required at the nurseries at all—as follows:—

Places for the insertion of young trees should be out—and Tahsíldárs are requested to go along the lines and see this is properly attended to—at intervals of 20 feet.

This distance will be the distance to go by all through the district, except where streams and nallás cross the road, or where the soil is so bad and water is so far distant that trees cannot be expected to thrive. In such spots no attempt at planting trees should be made.

13. Having marked out the spots along one mile of roadway, the next thing will be to dig a small enclosure of 4 feet in diameter, and to enclose this with cactus or thorns, merely to mark the spot. In February and March the young trees will be inserted, and then the protection will be properly secured, and the bhistís will water the young trees once a day.

14. With a view to properly instructing the gang, Tahsíldárs will send in the tahsíl jamadárs and their gangs to me at the sadar by 20th December, when I will personally instruct them in their duties.

15. This provides for the district arboriculture generally, but there are gardens to be seen which may require an extra establishment. This establishment, if necessary, will also be provided.

16. For the sadar station, bhistís and tree care-takers have to be provided apart from those already allowed for.

The nurseries and gardens now hardly require seeing to.

The fruit of sarai garden to be auctioned.

Tahsíl garden.—Tahsíldár to have one man from his ten.

The málí of the garden near dák-bungalow is to remain.

Kacheri mango garden costs Rs. 60 a year, and gives nothing. Bhistí dismissed. The station bhistís will see to this; station jamadár responsible.

One shísham garden—no man required.
One bakáín do. do.

The málí of the Session house kothí will get an increase of pay of Rs. 2 a month = Rs. 8 a month.

	Rs.
Session house gardener at Rs. 8 per mensem—increase by Rs. 2 per mensem	96
Three kúlís at Rs. 5	180
Total ...	276

The Session house garden to be an ornamental one, and no wheat or standing crops to be allowed in it. Such crops will be grown exclusively in the Session house garden on the side of the Dínanagar road.

		Rs.
Station Garden.		
1 Málí at Rs. 8	... ...	96
2 Kúlís „ 4-8	... ...	108
6 „ „ 5	... ...	360
	Total ...	564

This garden costs Rs. 564 per annum, and gives a return of Rs. 189.

The Session kothí and station garden men will be all kept up in addition to the establishment otherwise maintained. Tahsíldárs directed that all old servants are to be retained before new ones are entertained.

The nurseries will be as follows: One in the plot near the shísham garden, the other in the station garden for which a site will be selected. One of the station bhistís will daily work at the Kacheri enclosure.

The Batála tahsíl garden must be looked after by the Batála gang, and this also applies to the tahsíl gardens at Shakargarh and Pathánkot. A separate gardener cannot be sanctioned, but Tahsíldárs can, if they choose, take one man from the gang and keep him at the tahsíl gardens.

Resolved, that the above scheme be sanctioned.

15.—SIALKOT DISTRICT.

General Remarks.—The rainfall was less than that of the preceding year and under the average, but, on the whole, the year was not an unfavorable one for arboriculture. Nothing abnormal transpired, no unusual storms or frosts. White-ants are a pest in this district, and many hundreds of young seedlings were destroyed by them. The results of the operations of the year may, however, be considered satisfactory.

Description of Work.—Seedlings for planting on roadsides are raised in the nurseries on the Amritsar road and the District Fund gardens, but for the most part they are obtained from zamíndárs' wells. Some of these nurseries have not been properly cared for. The well in the Dhuá Sanda nursery ran dry, and water had to be obtained from a neighbouring zamíndár's well, so the whole of the ground could not be utilized; one acre of it was sown with shísham, mango (behara), *terminalia*, mulberry and siris seed, and several thousands of young plants will be ready in a year or so. The District Committee has sanctioned the proposal to make a new well in order to get a sufficient supply of water.

Young plants on roadsides are protected by a fencing of *euphorbia* or thorn bushes. During winter they are secured against injury from frost by a covering of rice-straw or múnj grass.

Trees are planted out twice a year, *viz.*, in February, and again in July and August

A detail list of the trees usually planted in this district was given in paragraph 4 of the report for 1881-82. This year a few plants of the following varieties have been planted, *viz.*, tún, simbal, pípal and ním trees are planted in avenues on both sides of the roads; there are a few groves of shísham on some of the roads and near public buildings. Those round about the Kacheri and police lines afford plenty of shade for suitors and others.

Tree lopping and pruning.—The work of trimming and lopping trees is undertaken in November. In the outlying tahsíls orders are sent to Tahsíldárs who call upon the zaildárs and lambardárs to superintend the work on the roads lying within their respective circles or villages, carpenters are employed, and the lopping is done under the direction of the málís. At the head-quarters tahsíl supervision is exercised by the overseer of arboriculture, who occasionally inspects the work in out-tahsíls also.

There are strict orders that nothing but the saw should be used, but the carpenters have often been found chopping off branches with their axes. They don't understand lopping at all, and they spoil the trees. Lopping was done to a less extent this year than in 1881-82. More attention has been given to this work of late.

Besides the supervision of the zaildárs, lambardárs and daroga exercised during the operation, the Tahsíldárs and District Officers inspect the work during their tours.

The sub-committee of arboriculture proposed to abolish the present system altogether and to make over the work of planting and maintenance of the trees to zamíndárs, who were to be paid according to results; but the proposal was negatived by the District Committee as impracticable. It is, however, worthy of consideration whether it would not be better to encourage owners of wells on roadsides to keep up small nurseries of a rood or two in area,

paying them according to the number of trees ready for transplanting, or at a fixed scale per annum. The advantages of having small plantations like these by the roads on which the trees are to be planted are obvious.

Several persons were prosecuted for allowing cattle to trespass and to destroy the trees on roadsides. There were also a few cases of theft of wood (the lopping); convictions were obtained in most cases, and these practices, which were becoming too common, will no doubt decrease.

Operations of the year.—This is divided under two heads—(1) new work; (2) going over the work of previous years and the maintenance of existing trees. There is not much in the shape of new work to be done in this district where most of the roads have been planted with avenues on both sides throughout their length. There are probably not more than 70 miles of main lines of roadway in which trees have not or cannot be planted. Parts lie in the beds of rivers, and in parts the soil is so sandy or saline that it is impossible to grow trees in them.

(*a*). *New work.*—Two miles of the Dera Nanak road in the Raya tahsíl, and one mile of the Jammu-Pasrúr road in the Zafarwál tahsíl, were planted with shísham, mulberry and siris trees on both sides at short distances; 3,000 trees were put down, of which 514, or nearly 20 per cent., are reported to have failed.

(*b*). About 2 acres of each of the encamping-grounds Dhamthal, Kullowál and Dharmkot were planted with fruit and other trees.

The Dhamthal encamping-ground of 32 acres has been abandoned; 2 acres have been planted with 800 mango and other trees, of which 700 are said to be thriving. It is intended to convert the whole of the encamping-ground gradually into a large plantation of mango.

The Dharmkot encamping-ground has been reduced by 43 acres; 340 mango trees have been planted in about 2 acres, and the remaining are or will be similarly treated. The trees are very thriving, and the zaildár looks after them very well.

The Kullowál encamping-ground has been reduced by 3½ acres, of which 2 acres have been planted with 600 mangoes; only 50 plants were unsuccessful.

During the year 425 miles of avenues on both sides of roads, planted in former years, were gone over, and most of the blanks and gaps left by removal of dead trees or by failures were filled up with 26,618 trees, of which about 85 per cent. are reported to be alive. The percentage of losses is smaller than that of the previous year.

The largest amount of work was done in the Siálkot tahsíl on 129 miles of road: 10,982 seedlings were planted, with only 8 per cent. of failures. In the Daska tahsíl, in 96 miles, 5,001 trees were put down, but 25 per cent. were unsuccessful. The large proportion of failures was probably due to the seedlings being too young, or to want of care. In the Raya tahsíl 54 miles were looked over and 4,580 trees planted, of which 89 per cent. were alive at the end of the year. Least work was done in the Zafarwál tahsíl: only 39 miles were gone over and 2,110 trees planted, of which no less than a third died. For some reason tree-planting in this tahsíl has always been in a backward state as compared with the others.

Station garden.—In the station garden a number of trees and shrubs were planted. The nurseries for supplying roadsides and the people of the district with plants have been kept up. A new plot of ground was sown with mango seed, and there will be some thousands of young plants ready for distribution by next February. Attention has also been given to the propagation of fruit-trees and flowering shrubs by cuttings, layering, grafting and inarching. Several hundreds of cuttings have been successfully put down. Some new and good varieties of fruit-trees, especially peaches, nectarines, grapes and apricots, also roses, have been introduced from the Saháranpur and Lahore gardens. The free distribution of plants to zamíndárs and others from the gardens continues. A large number of mulberries have been taken by residents of Kila Sobha Singh and Siálkot, who are forming plantations for supplying leaves for the rearing of silkworms.

Experiments: Carob.—Some carob seed was obtained in 1881 from the Conservator of Forests. The seed germinated fairly, but many of the seedlings died off; there are, however, over a hundred well-grown plants now in the garden for distribution. More seed has been received this year.

Eucalyptus.—There are a number of fine young *eucalyptus* plants of two or three varieties, probably *tereticornis, gigantea* and *leucoxylon,* over four feet high, for distribution. A few were given to a lambardár in Bajwát, where they are reported to be doing well, and a few have been planted experimentally on roadsides. The varieties *citriodora* and *siliqua* have been found to thrive here better than any others. More sowings will be made this year.

A small garden is kept at every tahsíl in which small nurseries are maintained. The Zafarwál and Pasrúr gardens, which contain a large number of fruit-trees, should become profitable in the course of a few years, but impossible if no good gardeners are appointed.

Besides planting trees on roadsides, 1,840 trees were planted at other places, such as enclosures of public buildings, encamping-grounds, the Karlup (bund) embankment. There is a small yearly income from the múnj grass planted on the Aik embankment. About 20 *eucalyptus* were put down in a clump at the rest-house of Phukalián in Bajwát in February last, and are reported to be thriving.

Future plan of operation.—As before stated, there is not much new work to be done in this district; a new road has been made this year from Kila Sobha Singh to Nárowál, which will be planted out during the current year; the plantation of mangoes at disused encamping-grounds will be extended. But the principal work will be to fill up gaps in existing avenues on roadsides and at public buildings.

Establishment and Supervision.—The following establishment for maintenance of trees and supervision was kept up during the year, *viz.*:—

	Rs.	Rs.
For roadside plantations.		
6 Málís at Rs. 5 each	360	2,033
45 Bhistís „ 4 „ 1 at Rs. 5	1,673	
At Nurseries.		
2 Málís at Rs. 4 and Rs. 5	108	132
1 Kúlí boy at Rs. 2	24	
On the Karlup embankment.		
1 Málí at Rs. 5		60
At the Encamping Grounds.		
3 Málís at Rs. 5 for short periods	68	172
3 Bhistís „ 5	104	
At the site of the Gulu Shah fair.		
1 Bhistí at Rs. 4		48
A Daroga or overseer of arboriculture at Rs. 25 ...		300
Total Rs.		2,745

The expenditure in the previous year was Rs. 2,334; the increase is due to the employment of málís and bhistís on the plantations at encamping-grounds, and a few extra bhistís for watering roadside trees. The bhistís were not kept up throughout the year, but only for such periods as they were actually wanted.

The miscellaneous expenditure was as follows:—

Fodder for cattle at nurseries ...	... Rs.	97
Purchase of bullocks for „ ...	... „	100
Price of plants ...	... „	7
Hire of bullocks ...	... „	6
Conveyance of plants, and lopping trees	... „	163
Purchase of carts ...	... „	68
Petty items ...	... „	15
	„	456
Total charges	... „	3,201

Financial results.—The receipts have been as under:—

By sale of decayed trees and fallen timber on roadsides, &c.	... Rs.	2,208
Do. tree-loppings	... „	290
Do. múnj grass	... „	81
Compensation awarded by courts for injury to trees	„	5
Petty savings from establishment	... „	8
Total receipts	... „	2,592
Charges as detailed above	... „	3,201
Deficit	... „	609

The financial results of this year indicate an increase of expenditure over the income of Rs. 609; last year there was a large profit of Rs. 1,675.

The decrease in income has been almost wholly under the head of "proceeds of sale of tree-loppings"; it is due to the following causes:—

Trees had not been properly trimmed for some years, and during 1881-82 a good deal was done in the way of pruning and lopping undergrowth.

All the loppings of the year under report were not disposed of during the year.

The former system of selling the lopping and trees on the spot was abolished on account of the great peculation which went on in the tahsíls, and the system of collecting all decayed trees and loppings at central depôts was introduced. By this arrangement it was thought that the income would increase, and the people of neighbouring villages would have a better chance of purchasing at periodical sales. But the arrangement does not appear to suit the tahsíl establishment, and has met with opposition. The loppings have not been collected quickly nor sales regularly held. This matter will be brought before the Committee for consideration.

LAHORE DIVISION.

Remarks by Commissioner.

Lahore.—In the Lahore District a systematic attempt at tree-planting has been carried out, both by Tahsíldárs from District Funds and by Municipalities, with varying success. The Tahsíldár of Lahore appears to have been least successful. The cost of establishment was Rs. 2,398; and, deducting Rs. 515 from the sale of fallen and dead trees, the net cost was Rs. 1,883. The cost incurred by the Municipality has not been shown, though they are stated to have planted successfully 8,737 trees.

Gujránwála.—In Gujránwála only 397 trees were successfully planted, the establishment being chiefly employed in maintaining the trees previously planted.

The expenditure incurred on establishment was Rs. 3,498, and, deducting Rs. 515 for the sale of fallen and dead trees (curiously the exact sum realized at Lahore also), the net cost was Rs. 2,983. The Deputy Commissioner notices the fact that a large number of young sissú trees of from twelve to fifteen years' growth died suddenly, without any apparent cause, in the Civil Station.

Ferozepore.—In the Ferozepore District a vigorous attempt at tree-planting has been made, 54,072 trees having been planted, of which 12,312 have died, leaving 41,760 young trees living; and in the Mamdot estate 22,160 trees have survived.

The total cost incurred was Rs. 6,668, which would make each tree cost Re. 0-2-6.

The seedlings are generally put down too young, and, unless the soil has been properly prepared, a large proportion must die.

Loppings generally appear to have been made by the employés, and, as noticed in Conservator's letter No. 15 of the 9th May, is not carried out with sufficient care or knowledge.

16.—LAHORE DISTRICT.

General Remarks.—The rainfall was copious, even more so than it was last year, the total fall being 22·4 as against 18·2 previously; it was seasonable also, and proved favorable for tree-planting operations.

No calamitous events occurred; I have therefore no damage by fire or hail to place on record. From one tahsíl alone, that of Chunián, comes any complaint whatever of white-ants destroying young plants; but the damage done there was trifling. The reports of all the Tahsíldárs on the condition of the avenues and groves under their care are fairly satisfactory—more so than they appear to have been in previous years.

As might be expected, roadside avenue planting and tending roadside trees were the works on which the district arboricultural establishment was principally employed. Very little, if anything, was done in the way of planting groves or opening new nurseries.

Description of Work: Avenues.—During the year a total length of 8 miles of avenues was added to the roads in the district, the following kinds of trees being used, *viz.*:—shísham, farásh, kíkar, siris, tút, jáman and pípal—more shísham was planted than any of the other kinds. In addition to planting new, and extending old, avenues, nearly a thousand saplings were put down to fill up the gaps caused by trees being blown down and deaths in existing avenues. I proceed now to notice, in detail, the work done in each tahsíl.

Lahore Tahsíl.—Another mile of the Lahore-Harike road has been planted during the year, but out of 531 trees put down, 300 died. That so large a proportion of the new plants should have perished, is unsatisfactory, especially as canal-water is procurable for nearly 8 miles along the road. I have called upon the Tahsíldár to render an explanation for the bad results obtained. It may be remembered that arboricultural operations on this road last year gave even worse results, for some 700 out of 900 trees planted, died; and the explanation then offered in the annual report was, that these unsatisfactory results were undoubtedly due to neglect on the part of the establishment: it seems almost certain that a similar explanation is the true one for the poor fruit that this year's labor has also borne.

No young trees appear to have been put down in gaps in previous year's plantings on this road.

The first two miles of the Rájghát-Sharakpur road has also been newly planted: 860 trees were put down, all of which, with the exception of 60, are reported to be flourishing. These favorable results are attributed to the good quality of the soil.

Going over old ground, *viz.*, the Meean Meer-Chhabil road, 400 trees were planted out to replace those that died off wholesale in previous years in consequence of the ravages of white-ants and of the effects of nitrate of potash in the soil. When former results are remembered, it is strange to find the Tahsíldár reporting that *all* the new plants now put down have taken firm root; but this is probably an exaggeration. I believe, however, that the Tahsíldár has been more successful this year than previously. A further report will be called for from him as to the operations on this road, and he will be asked to account for the good results now obtained.

Chunián Tahsíl.—In the Chunián tahsíl the avenues on the following roads were added to by the lengths noted against each:—

Chunián Verum	...	... ½ mile
Bhái Pheru	...	... ¼ „
Halla Nan	...	... ¼ „

In all, a mile of road has been planted with 1,525 trees; 375 trees were also put down in gaps on the two roads, Chunián to Wan Rádhárám and Chunián to Kanganpur.

The plantings were successful. On the whole, the results of the year's operations in this tahsíl were satisfactory. The Tahsíldár obtains his supplies of young plants chiefly from the Chánga Mánga rakh, and about 1,000 were obtained thence during the year.

Kasur Tahsíl.—The Tahsíldár of Kasur has added 3 miles of avenue to the roads in his sub-division, planting 700 trees on the Ganda Singhwála-Khudián road, and 1,000 on the Khem Karn-Patti road, as well as 80 in gaps on the Khem Karn-Kasur road. The plantings are reported to have been very successful. An attempt was also made to grow, from seed, kíkar along the whole length of the Ganda Singhwála-Sursingh road, but owing to a very heavy fall of rain the young seedlings were all destroyed. This experiment, however, did not cost much—only Rs. 8.

In this tahsíl also the results were satisfactory, and must be attributed to the interest taken by the Tahsíldár in arboriculture, as well as to the advantage derived from an extensive system of canal distribution.

Sharakpur Tahsíl.—In the Sharakpur tahsíl, too, a mile of avenue has been added, but only to the Rájghát-Bucheke road; 431 trees were planted, of which none are reported to have died. These are very good results. It is a pity that no more planting was done. The Tahsíldár appears to have contented himself with very little new work, applying himself chiefly to watering and tending previous years' plantings. The Tahsíldár's report states that during the winter young plants are watered once a week, and once every four days in the summer. His supplies of sapling are obtained from the tahsíl garden, and the nursery near Mangtawála on the Sharakpur-Mangtawála road.

Though much new work has not been done in this tahsíl, yet, to compensate, greater care has been taken of previous years' plantings than in any other tahsíl in the district. As will be seen from the statement of expenditure, &c., a good deal of money was spent on watering plants.

In addition to district arboricultural operations conducted with money supplied from District Funds, the Lahore Municipality, and the minor Municipalities of Kasur, Chunián and Khudián, also planted trees on the roads within their respective limits.

The following statement shows the number of trees successfully put down :—

Lahore Municipality	...	...	...	4,287	(farásh, shísham)
Sharakpur „	...	...	...	229	
Chunián „	...	...	...	727	
Khudián „	...	...	...	323	
Kasur „	...	...	...	3,171	

No trees were planted by the Patti and Khem Karn Municipalities, as they could not afford to spend anything in this direction.

Nurseries, &c.—The Tahsíldárs' reports contain little or no information regarding the formation of nurseries and groves. In Chunián there are no nurseries, as supplies can be easily obtained from the Chánga Mánga rakh. In Sharakpur, the tahsíl garden and a nursery near Mangtawála supply all local wants. The Tahsíldár incidentally mentions that there is only one roadside grove in his tahsíl, *viz.*, that on the Sharakpur-Rájghát road. In Lahore it is reported no new groves were planted during the year by zamíndárs.

Arrangements will be made to obtain next year a list of the nurseries and roadside groves, &c., in each tahsíl, showing when each was formed, area, &c.; and this will enable the Deputy Commissioner to see what progress has been made in this direction. The Tahsíldárs do not appear to have exerted themselves much in the formation of groves at central and convenient places, though their attention was invited to the matter.

Establishment and Supervision.—Appended to the report will be found a detailed statement of the establishment employed and the expenditure incurred from District Funds on arboriculture; the following is an abstract:—

Tahsíl	*Establishment*		*Total Expenditure*		
			Rs.	A.	P.
Lahore ...	5	men excluding bhistís	480	12	6
Chunián ...	11		517	3	9
Kasur ...	9		700	0	0
Sharakpur ...	9		700	0	0
Total ...	24		2,398	0	3

The expenditure has increased slightly, and this increase is due to the establishment in the Lahore tahsíl having been strengthened during the year; in other respects there has been scarcely any fluctuation. The district and sub-overseers supervise the planting and tending of trees in addition to their other duties.

In only one tahsíl, *viz.*, Sharakpur, was the system of paying zamíndárs for watering trees, planted close to their lands, resorted to, where Rs. 186 were paid on this account.

Financial results.—The expenditure on arboriculture, as has already been stated, amounted to Rs. 2,398-0-3; compared with this, the income from sale of fallen and dead trees was small indeed, *viz.*, Rs. 515-4-6, leaving the financial results entirely on the debit side. The following is a detail of the income :—

Receipts ...	Rs. 515	4 6
Charges ...	„ 2,398	0 3
Deficit ...	„ 1,882	11 9

Lahore	...	...	...	Rs.	80 0 0
Chunián	...	...	...	„	26 2 0
Kasur	...	...	...	„	329 1 0
Sharakpur	...	...	...	„	80 1 6

Last year the income amounted to only Rs. 330.

In none of the tahsíls were roadside trees lopped.

With regard to the Conservator's inquiry as to the agency by which lopping is done, whether by daily labor or under supervision or by contract, the reports received from the Tahsíldárs show that, when lopping is deemed necessary, the work is carried out by the ordinary establishment (the muháffiz) employed to look after the trees, and not by contract or by specially engaged labor. In Kasur the sub-overseer supervises this work.

16.—FEROZEPORE DISTRICT.

General Remarks.—Nil.

Description of Work.—Altogether 54,072 trees were planted during the year, whereof 12,312 have died, *i.e.*, 22·76 per cent.

Of the above, 34,809 trees were planted alongside the district roads and 19,263 elsewhere, *i.e.*, in gardens, canal bands, &c.

The average per cent., and the number of trees that have been safely brought up during the year, are 77·24 and 41,760 respectively.

Mamdot trees.—As the arboriculture of Mamdot is also under my charge, I beg to report briefly that, of the total number of trees that were planted in the said iláká, as many as 22,162 have been saved.

In planting new trees, generally the same plan was adopted as per my last report, *viz.*, that a portion of a road was allotted to a certain number of bhistís, and, when that was completed and the trees were strong enough to require only occasional care, the same establishment was pushed on to take up another portion of the same road.

Of course there were exceptions to this rule here and there, because in some places gaps were made in the line of trees, as some had perished notwithstanding all the care that was bestowed on them; therefore a special establishment had to be kept up until the gaps above alluded to had been fairly filled up.

As usual, the inundation canals have done much to promote the cause of arboriculture in this district.

Lopping.—The lopping of trees is carried on regularly every year about the month of February by the bhistís employed for watering young trees on adjacent roads (during their spare time), as also by the málís from neighbouring groves and avenues under the supervision of the daroga of arboriculture of this district.

When the trimming of trees is finished, the cut branches are collected at a convenient place in each tahsíl and sold off by public auction by the Tahsíldárs, and the proceeds are credited to General Local Fund of the district.

Financial results.—Rs. 6,668 were sanctioned for the year under report as follows:—

		Rs.
From the Provincial Fund, for the salaries of 1 daroga, 1 jamadár and 8 chaprásís	... ...	840
From the District Fund, for roadside trees	... ...	3,800
„ „ for trees elsewhere	... ...	1,228
„ „ for contingencies	... ...	800
Total as above	...	6,668

18.—GUJRANWALA DISTRICT.

General Remarks.—There was no particular event during the year under report which specially affected arboriculture. The rainfall was sufficient throughout the year. It was registered at about 24 inches on an average for the district. In the sadar station itself an unusually large number of trees died out during the past year, leaving in many places long gaps in the avenues. Very strangely, this loss has been confined almost wholly to young tálís (sissús) of from twelve to fifteen years' growth, at which age they attain in this locality an average height of about 40 feet, and a girth of trunk from 32 to 35 inches, measured 4 feet from the ground. As these casualties were not limited to one spot or to one avenue, but have occurred promiscuously through them all, and in many instances in trees immediately in contact with other tálís of the same age, still healthy and vigorous, it is difficult to suggest any specific cause (no signs of disease or damage to the roots being apparent) for this extraordinary scattered destruction; yet, no doubt, some cause would ere this have been traceable had it been limited to a small and circumscribed area.

Description of Work.—One mile of the Gujránwála and Hafizabad road was undertaken during the year, but otherwise the operations were chiefly limited to the care and preservation of trees previously planted on roadsides. Of the 522 trees planted as above, 125 trees died on their roots meeting with a sandy stratum. Blanks and gaps were filled where necessary. It is proposed to fill all vacancies in the roadside avenues during the ensuing rains with jáman (*Sizygium jambolanum*) seedlings from nurseries reared in the jail garden. The jáman, besides being an evergreen, is a much more shady tree, and as it moreover yields a fruit much liked by natives, would on all accounts, I think, be far preferable for avenue planting generally than any of the trees, *viz.*, farásh (tamarisk), sissú or siris (*Acacia S.*), to which the choice has hitherto been confined. The success of avenue planting, especially in parts of the district away from the supervision of European officers, depends, in my opinion, upon the extent to which the following rules can be carried out, *viz.*:—

1. The rearing of nurseries at wells as *near as possible to the portions of the road where the seedlings are to be used.*

2. The seedlings being planted at least 6 inches below the surrounding level (in pits generally 2 feet deep and 1 wide), and not, as is commonly the practice, on the summit of little hillocks of earth liable to be washed away during the first heavy rain.

3. Some certain means of watering the seedlings during the first two years after they have been planted out.

4. Some reliable method of securing the plants from the attacks of camels and goats.

It is my intention to carry out the ensuing season's operations as strictly in accordance with the above rules as may be practicable, and I trust with more successful and satisfactory results.

Plantations and nurseries—No new nurseries were planted during the year. Attention was chiefly paid to the tending and maintenance of trees already planted. 778 trees were planted elsewhere than on roadsides, of which only 12 died.

Method of planting—Is the same as last year, *viz.*, transplanting young trees from nurseries, fencing them with mud-walls, and watering them three times a week. Shísham, siris, mulberry and kíkar are the species of trees generally planted in this district.

Lopping—Is done with the saw, and the loppings are sold by auction to the highest bidders.

Rare plants and trees.—Six small plants of the "Australian Salt bush," each about 15 inches in height, were received from the Superintendent, Botanical Gardens, about this time last year, and are now under experimental cultivation in the jail garden.

It is a species of plant said to thrive in the poorest soil, to require little tending, to be rapid in its growth where it. succeeds, and to yield successive crops of fresh nutritious fodder for cattle all the year round. These plants have now grown to the height of four feet, but, as they have not as yet yielded any seed, no opinion can be formed as to whether their cultivation will result in success or not.

Establishment and Supervision.—The following establishment was kept up during the year:—

Road	*Details*	*Annual cost*
		Rs.
Gujránwála to Hafizabad	... 1 Jamadár on Rs. 10 per mensem	... 105
	1 Watchman „ 5 „	... 15
	30 Bhistís „ 4 „ each	... 1,134
		1,254
Do. to Amritsar	... 1 Jamadár on Rs. 10 per mensem	... 120
	8 Bhistís „ 4 „	... 384
		504
Do. to Shekhupura	... 1 Jamadár on Rs. 10 per mensem	... 120
	12 Bhistís „ 4 „	... 534
		654
Do. to Batála	... 5 Bhistís on Rs. 4 per mensem	... 128
Do. to Khiáli	... 3 „ „ „	... 144
Do. to Rámnagar	... 4 „ „ „	... 192
Do. to Siálkot	... 1 „ „ „	... 25
Do. to Kila Mián Singh	... 1 „ „ „	... 25
Do. to Naushahra	... 1 „ „ „	... 25
Station roads	... 1 Mate	... 21
	4 Bhistís on Rs. 4 per mensem	... 200
		221

			Rs.
Sarai Ghakkhar	... 1 Bhistí	...	48
Wazirabad to Rámnagar	... 2 Bhistís	...	50
Wazirabad dák-bungalow	1 Bhistí	...	24
	1 Watchman for other roads	...	17
Mutteke rest-house	... 1 Bhistí	...	48
Garden at Hafizabad	... 1 Gardener	...	18
	3 Bhistís	...	84
			102
Sarai Pindi Bhattián	... 1 Bhistí	...	10
Miscellaneous charges	... ...	...	27
	Grand total	...	3,498

The Tahsíldárs and Náib-Tahsíldárs supervise the establishment. The Deputy Commissioner and his Assistants inspect the trees on their periodical tour.

Lopping.—The lopping was done with the saw, and was carried out with sufficient care, under the supervision of the Tahsíldár, Náib-Tahsíldár and jamadárs, by daily labor.

Financial results.—The total expenditure amounted to Rs. 3,498, or Rs. 265 more than in the previous year. Rs. 515 were obtained from the sale proceeds of loppings, though Rs. 232 were not credited in accounts during the year owing to the negligence of the Tahsíldár. The net expenditure was Rs. 2,983. The station roads with the tree-planting thereon are in charge of Dr. Quinnell, the Civil Surgeon, who has a special taste in that direction. I am much indebted to him for the care he has been bestowing on the station roadside planting, and for several important suggestions.

Receipts	... Rs.	515
Charges	... „	3,498
Deficit	... „	2,983

In conclusion, I would suggest that copies of Financial Commissioner's consolidated circular No. 34 of 1882 be circulated to all álá-lambardárs, as I am persuaded the favorable conditions under which gardens and orchards, wayside groves, and timber plantations can be made are not known to the general population. It is vain to expect Tahsíldárs will circulate the contents of such circulars, as giving operation to the orders of the Government causes extra work to them and their staff.

RAWALPINDI DIVISION.

Remarks by Commissioner.

The Deputy Commissioner, Shahpur, takes the most lively and intelligent interest in this work, of all the Deputy Commissioners of the Division. Commissioner fears his loppings have been unnecessarily severe; where trees should have been allowed to grow wide they have been reduced to little more than sticks, but the next year's tour will show him the result.

19.—RAWALPINDI DISTRICT.

General Remarks.—The rainfall was above the average, but long intervals occurred between the falls, and the season was therefore not favorable for tree-planting.

Description of Work.—The work done during the year consisted chiefly of filling up gaps and blanks in avenues, the formation of avenues by sowing of seed in trenches along the roadsides, and the finishing of the avenue on the Gondal and Hazro road in the Attock tahsíl.

Considerable amount of work was done in each tahsíl.

Tahsíl Rawalpindi.—A large number of trees was planted on the roads in this tahsíl in the months of July and August 1882, and March 1883. Owing, however, to a cessation of rain and the attack of white-ants the proportion that died was large.

The trees planted were shísham, kíkar and phulái. The shísham thrives in localities bordering on the hills; the kíkar and phulái in other parts.

The tahsíl is an average one for tree-planting.

Exclusive of the 27 roads entered in the tabular statement on which trees have been planted, there are 24 groves and nurseries in this tahsíl.

In 214 villages, 45 maunds of shísham seed and 5 maunds of kíkar seed—the latter obtained from the Khárián tahsíl of the Gujrat District—were sown by lambardárs on an area of 65 acres 2 roods. 476 trees were planted on wells, tanks and at masjids in villages.

The planting of trees on roads is carried out through the agency of village headmen.

In places where water is scarce and at a distance, a few bhistís are employed.

Tahsíl Attock.—In this tahsíl the unplanted portion of the road from Gondal to Hazro, a distance of 2 miles, was successfully finished during the year. On the 2 miles 992 trees were planted, and enclosures constructed round each for protection. The trees are chiefly shísham and mulberry. The planting was done under the supervision of the Tahsíldár, at a cost of Rs. 250. A further expenditure will be necessary on the watering of the trees during 1883-84.

Four hundred trees were planted in filling up blanks on the road from Hasan Abdál to Usman Khattar, of which only a few died.

There are 2 groves and 3 nurseries.

In the Chak iláká of this tahsíl trees can be grown generally without difficulty. In the Haro iláká shísham thrives tolerably well. In the remaining ilákás the soil is hard, and the kíkar and phulái are the only trees suited to them.

Tahsíl Fatahjang.—On the 8 roads in this tahsíl a large number of trees, chiefly kíkar, was sown in filling up blanks.

Except in iláká Sohan, tree-planting in this tahsíl is difficult, owing to the ground being hard and rainfall scanty. The kíkar thrives best.

In accordance with instructions issued by me last year, 50 maunds of kíkar seed, obtained from the Gujrat District, were sown in trenches on the roadsides; but the result has not been good, as the sowing was not properly effected.

This rainy season more kíkar and phulái seed will be sown, and I hope with better results.

The shísham only thrives in some places in the Sohan iláká.

Tahsíl Gujar Khan.—For some years past it has been the practice to sow kíkar seed in trenches on the roadsides in this tahsíl, which practice continues.

The Tahsíldár, Ajab Singh, takes an interest in arboriculture, and the result is that trees are to be seen on most of the roads in his tahsíl. Plants a year or two old are growing in masses.

This system is most suitable to this tahsíl. The trenching and sowing is carried out at a small cost by the tahsíl agency, and the kíkar thrives well.

During the year 18 maunds of kíkar seed was sown in trenches.

It is possible to grow the shísham in some localities, but in my opinion the kíkar is the best suited for the tahsíl generally.

Tahsíl Kahuta.—In filling up blanks in the avenues in this tahsíl, a large number of trees was planted, but, owing to the cessation of rain and the excessive heat that followed after the planting, a large proportion died.

There are 8 groves and 7 nurseries.

The climate, rainfall and soil of this tahsíl render it particularly well suited for the propagation of trees.

When on tour in this tahsíl last winter, I issued instructions to the Tahsíldár relative to the tree-planting operations in the current year. The result of this operation will be noticed in the report for the year 1883-84.

The trees planted in this tahsíl are chiefly shísham, túm and mulberry.

Tahsíl Pindigheb.—The climate of this tahsíl is unsuited to arboriculture. It is hot, the ground hard, and water scarce. It is therefore difficult to propagate trees—few were consequently planted during the year.

The best iláká is that of Síl, where the shísham can be produced, but generally the phulái only thrives.

It is possible to experiment with the kíkar seed in some places, but results are not likely to be promising, owing to the hard nature of the soil.

The methods most suitable for tree-planting in this district are—

I. The planting of tún and shísham in the ilákás where the soil is good and the rainfall generally sufficient.

II. The sowing of the kíkar seed in trenches in ilákás with soil of an average quality and average rainfall.

III. The sowing of the phulái seed in ilákás where the rainfall is scanty, the climate hot, and ground hard.

Method I.—In those tracts where the tún and shísham thrives, the existing trees have been planted by the lambardárs or through their agency. This arrangement should, in my opinion, be continued.

The zamíndárs have nurseries at their wells, and they can obtain, if necessary, plants of spontaneous growth from the ravines for the purpose of transplanting into the avenues.

Enclosures round the trees or plants should be made by the zamíndárs, for which there is abundance of thorny brushwood procurable from the Guzára lands of the zamíndárs.

In remuneration for their trouble I would reward the zamíndárs at some fixed rate per tree for all trees found alive after one year.

The transplanting by the zamíndárs should be supervised by the village headmen and inámdárs.

The work generally should be supervised by a Government official. The tahsíl overseer might be employed on this work.

Method II.—In the tracts of average quality where the kíkar thrives best, it will suffice if trenches are dug on both sides of roads and the kíkar seed is sown in them.

This work can be efficiently carried out by the agency of the tahsíl establishment at a small cost.

After two or three years, when the trees are two or three feet high, and are promising, they should be thinned, that is, where the plants are too numerous and close together, some of them should be removed, and planted in places where the seed has not germinated.

The enclosures for the protection of the young plants can be made of the branches lopped from trees and thorny bushes.

In these tracts it will be difficult to raise any tree except the kíkar. Bhistís could do little to ensure the growth of any other description of trees, and the expense of keeping up a watering establishment would be large.

Method III.—In tracts of the third quality where the phulái thrives, to attempt the propagation of trees by maintaining an establishment of bhistís would be difficult and expensive. The phulái grows slowly and attains a good height after several years.

It will be sufficient on these tracts if trenches are dug on the sides of roads and seed sown in them as in tracts of the second class.

In hard and dry soil, such as is comprised in the third class, the phulái only will grow.

This work of trenching and sowing can be done effectually through the agency of the tahsíl establishment.

In a district so extensive as this, to attempt propagation with establishments of bhistís and málís would entail an enormous expense. Proper supervision also would be difficult.

Trees generally suffer from want of care; if made over to the zamíndárs, they would protect them from injury as far as possible, partly from a sense of responsibility, and partly for the sake of rewards.

For these reasons the most advantageous system for this district is the planting of trees through the agency of zamíndárs.

In ilákás where the kíkar and phulái seed is sown in trenches, care is not so much needed, as the trees grow in masses, and if any die from injury a sufficient number still remain.

Plan of future operations.—The Progress Report on Arboriculture in the Province for the year 1880-81 was received when I was about proceeding on leave, and the orders contained in paragraph 6 of the Government review, regarding the working plan for future use, were not brought to my notice. It is only now that I find from the Government review on the report for 1881-82 that a scheme is to be proposed. This report was received on the 7th instant, and there is no time to elaborate a working plan which could be noticed in this report. Any plan that may be devised must be on the lines indicated above. When on tour in the ensuing winter, a working plan for the district will be elaborated and reported upon in the report for the current year.

Work within Municipalities.—The several Municipal Committees of the district have planted a number of trees within the limits of their respective Municipalities.

Public Gardens.—Attention has been bestowed on the propagation and increase of fruit-trees which are obtained by the people from the public gardens.

These gardens are maintained at a large expense.

The stock of fruit-trees in these gardens was largely added to by supplies of different sorts of fruit-trees procured from the Botanical Gardens at Saháranpur and Lahore during the year.

Establishment and Supervision.—A head gardener, obtained from the Superintendent, Botanical Garden of Saháranpur, supervises the gardens. He is an active intelligent man, and receives a salary of Rs. 25 per mensem.

The following is a detail of the establishments :—					Rs.
1 Head gardener at Rs.	25	per mensem		...	300
1 2nd "	12	"		...	144
1 Málí	10	"		...	120
1 "	8	"		...	96
1 "	5	"		...	60
24 Kúlís	6	"	each	...	1,728
2 "	5	"	"	...	120
					2,568
Miscellaneous expenditure on feed of oxen, &c.				...	1,510
			Total	...	4,078

Where trees are planted, this is done by the zamíndárs; and where seed is sown in trenches, a small expenditure is incurred at the time, and the work is done by the tahsíl establishment. No establishments are therefore needed in this district, generally. During the year 3 bhistís only were entertained to water trees on the Khanadak road at a cost of Rs. 180.

For the watering of the trees recently planted on the Gondal and Hazro road it has been considered necessary to entertain an establishment consisting of 3 pakhál-men and 1 chaprási, which will be required for about five months.

	Rs.
Receipts	... 110
Charges	... 516
Deficit	... 406

Financial results.—The total expenditure incurred on arboriculture in the district amounted to Rs. 516, and the income from lopping of trees and other sources was Rs. 110. The income and expenditure on the public gardens are not included in these amounts.

20.—JHELUM DISTRICT.

General Remarks.—The year was not very favorable for tree-planting operations, as young plants were liable to be scoured out by the excessively heavy rains at the planting season; the operations were therefore restricted as compared with the previous year.

Description of Work.—In the tahsíl of Jhelum sissú trees were planted on the road-sides, as mentioned in the tabular statement, with the following results :—

Trees planted	...	...	...	1,520
" died	...	...	...	140
Still thriving	...	...		1,380

and in the Pind Dádan Khan tahsíl, of 474 trees planted, only 13 died: In the Chakwál tahsíl 200 cuttings were planted, of which 69 have since died; and in the Talagang tahsíl 541 were planted on roadsides, of which 80 died, and the remaining 461 are still thriving.

10,500 fruit-tree cuttings were planted in the public gardens at Jhelum, of which only 200 died, but in the Pind Dádan Khan garden only 486 of the 844 put down have taken root. 1,382 cuttings were planted in the Chakwál tahsíl, all of which are prospering; and in the Talagang tahsíl only 50 of the 500 cuttings planted have died.

The following statement shows in detail the number of seedlings, cuttings and young trees planted in the different tahsíls:—

Tahsil	Quantity of seed sown	*Number of seedlings grown*			*Cuttings planted*			*Trees planted on roadsides*		
		Number of trees grown	Number of trees failed	Number of trees succeeded	Number of cuttings planted	Number of cuttings failed	Number of cuttings succeeded	Number of trees planted	Number of trees succeeded	Number of trees died
	Mds.									
Jhelum ...	5	24,000	6,000	18,000	10,500	200	10,300	1,520	1,380	140
Pind Dádan Khan ...	...	...	...	...	844	388	456	474	461	13
Talagang ...	1	1,600	300	1,300	500	50	450	541	461	80
Chakwál ...	...	...	...	...	1,382	...	1,382	200	131	69
Total ...	6	25,600	6,300	19,300	13,226	638	12,588	2,735	2,433	302

About 11 per cent. of cuttings put down during the year under report failed, owing to the excessive rains which rotted both seeds and cuttings.

Establishment and Supervision.— The following establishment was employed during the year under review:—

6 Gardeners	4 Pakhálís
43 Kúlís	5 Mates
3 Bhistís	1 Jamadár

The months of February, July and August are considered the best seasons for tree-planting. In these months the work is always taken in hand, and instructions issued accordingly to the establishment concerned. Young plants at least 6 feet high are chiefly transplanted to roadsides, as they prosper better than the smaller ones, which are nearly always destroyed or injured by cattle.

Young trees are invariably protected with a fence; and a drain a foot deep dug round the roots to receive and retain rain-water.

Village headmen are held responsible in general for the care of all plants, trees and seedlings put down and sown on roadsides and plantations in the interior of the district. The plants, however, at the new plantation at Nagráon on the road to Pind Dádan Khan having failed from neglect in the first instance, a water-man is employed as a temporary arrangement for the tend of the plantation, which is now striving satisfactorily. A new plantation on the roadside near Chak Jamál has recently been formed, and is likely to thrive satisfactorily, as a well has been sunk at the locality for convenience of travellers, and will afford watering for the plants in dry seasons.

The plants and young trees are inspected by Tahsíldárs when on tour in their respective tahsíls, and by District Officers while on circuit.

The establishment entertained during the year under review was the same as in the preceding year, and worked on the whole in a satisfactory manner.

Financial results.—The following statement shows the receipts and expenditure during the year under review. Compared with the results of the preceding year, there is a slight increase in expenditure and decrease in income: the former is attributable to the

harges for the purchase of bullocks and fruit seedlings from the Saháranpur gardens, and he latter to less income having been derived from sale of tree-loppings during the year nder report. The loppings of the preceding year having been effectively performed, recent perations in this respect to the same extent were unnecessary.

Tahsil	Receipts			Charges				Remarks
	Tree-loppings	Gardens	Total	Gardens	Nurseries	Plantations	Total	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Jhelum	387	244	631	2,541	300	708	3,549	
Pind Dádan Khan	54	173	227	384	351	...	735	
Chakwál	102	131	233	458	118	144	720	
Talagang	4	8	12	223	170	104	497	
Total 1882-83 ...	547	556	1,103	3,606	939	956	5,501	Deficit Rs. 4,398.
Total 1881-82 ...	...	...	1,704	...	...	...	5,381	
Difference	...	...	-601	...	...	...	+120	

Zamíndárs have been from time to time enjoined by members of the District Committee and Tahsíldárs to have trees and plants reared in the precincts of the villages with a view to the comfort of rural communities and the aid of official operations in the extension of arboriculture.

21.—GUJRAT DISTRICT.

General Remarks.—The year 1882-83 was a very favorable one for tree-planting owing to the plentiful rainfall.

In this district there are no large tree-plantations.

No fires have taken place, nor has any other event occurred specially worthy of mention in this report.

Description of Work.—Tree-planting has been successfully carried out in the district during the year, *i.e.*—

On the 6 miles of road between Gujrat and Bhimbar, the description of trees planted were shísham and kíkar in the place of trees that had died out.

On both sides of the roadway from Gujrat to Phalián up to a distance of 30 miles, young shísham, siris, ber and tút trees have been planted where the former trees had died out.

On the road from Gujrat to Jalálpur, for a distance of 2 miles on both sides of the road, young shísham, siris, tút and ber trees have been planted out, in the place of former trees that had died out.

On two miles of the road from Gujrat towards Shádiwál, young shísham trees have been planted out to replace the old trees that have died.

The prescribed return showing the above is annexed.

Forest groves, nurseries and plantations are not included in this return.

Large numbers of shísham, kíkar, siris, ber and tút trees have been planted out to replace trees that had died out on district roads; details are as above.

No new groves, nurseries or plantations have been planted out in the year 1882-83.

There is a small nursery in the Church garden at Gujrat; from this nursery 3,000 young shísham, mulberry, siris, ber, pípal and bor trees have been planted out with great success.

Establishment and Supervision.—The establishment given below has been maintained for planting, watering and fencing the young trees:—

						Rs.
1 Jamadár	...	at Rs.	8	per	mensem ...	96
9 Kúlís	...	„	5	„	„ ...	540
1 Chaukídár for watching roadside trees	...	„	5	„	„ ...	60
Other contingencies	...		...		...	50
				Total	...	746

In addition to the above, the temporary establishment given below was employed in 1882-83:—

	Rs.
In tahsíl Gujrat, 5 bhistís or kúlís for 6 months ...	150
„ Khárián, 8 „ „ „ ...	240
„ Phálian, 4 „ „ „ ...	120
Total ...	510

Rs. 45 have been spent for making up new *maskaks* for watering young trees:—

In tahsíl Gujrat	...	Rs. 20
„ Khárián	...	„ 15
„ Phálian	...	„ 10
Total	...	„ 45

The district roadside trees are carefully lopped with the saw; the work of lopping is done by paid servants under the supervision of the Tahsíldárs of each tahsíl.

The district overseer, Chamba Mal, has been carefully attending to the planting, transplanting and watering of the young plants in the nursery and on the roadsides.

No separate establishments have been employed for separate works except the establishments noticed above.

Receipts ...	Rs.	*Nil*
Expenditure ...	„	1,301
Deficit ...	„	1,301

Financial results.—Rs. 1,500 was allotted for arboricultural purposes in 1882-83; of this sum, Rs. 1,301 were expended, and the balance, Rs. 199, lapsed to Government at the end of the financial year 1882-83.

22.—SHAHPUR DISTRICT.

General Remarks.—The rainfall of the year under report was much in excess of that of the last year. The work of planting trees was carried out under the superintendence of a trained Forester, and the extent of success of the operations taken in hand during the year is detailed below. The Forester also superintended the lopping of trees, which was carried out by kúlís temporarily employed. The Commissioner was afraid that this lopping, as it was carried out, would be injurious to them, but they have now burst forth and thrown out fine young branches, which shows the Chánga Mánga system to be a good one.

Description of work.		*Locality*	*Number of trees planted*	*Number of trees died*
	1.	Road from Shahpur to Kachewála ferry	2,962	...
	2.	Civil Station roads	10,030	613
	3.	Road from Miani to Haria	2,200	1,400
	4.	„ Vazidi to Bhera	10,000	7,000
	5.	Khusháb to Nurewála	500	200
	6.	„ to Kathá road	50	15
	7.	Compound of Deputy Commissioner's bungalow	220	...
	8.	Government stallion stable compound ...	50	...
	9.	Sessions bungalow compound ...	350	20
	10.	Staging „ ...	700	100
	11.	Kacheri compound ...	15	...
	12.	Tahsíl „ ...	442	50
	13.	Encamping-ground, Bhera	3,200	2,122
	14.	„ Miani	200	100
	15.	Plot in front of tahsíl Bhera ...	50	30
	16.	Plot around the tank at Khusháb ...	200	125
	17.	Plot in front of sarai at Khusháb ...	1,010	50
		Total ...	32,179	11,825

The description of trees planted chiefly is the kíkar, shísham, tút and sharín and pípal at spots Nos. 3, 7 and 13. The various kinds of trees, *viz.*, mangoes, jámans and date-palms, were planted in the Kacheri compound only, and they appear in a flourishing condition. Besides the plantations described above, 8 gardens were also maintained, and the income and expenditure of all these sources is given under the head "Financial results."

Establishment and Supervision.—The plantations and gardens are, as already stated before, under the supervision of a professional Forester, and the Tahsíldárs also assist him in regard to works connected with plantations and gardens situated in their respective jurisdictions.

The establishment kept up during the year under report was—

1	Forester	at Rs.	30	per mensem
7	Málís	„	6 to 10	„
25	Kúlís	„	4 to 5	„
10	Beldárs	„	5	„ each

A second daroga is under training at Chánga Mánga at the cost of the District Committee, and will be employed when he has learnt his work.

Financial results.—The following is an abstract of receipts and charges on account of gardens and tree-lopping:—

Receipts.

	1881-82	1882-83	Difference
	Rs.	Rs.	Rs.
Sale of garden fruit	176	276	+100
„ tree-loppings	275	338	+ 63
	451	614	+163

Charges.

	1881-82	1882-83	Difference
Station garden establishment	1,503	1,134	−369
Nursery gardens in tahsíl Khusháb	763	999	+236
Roadside trees establishment	495	600	+105
Temporary kúlís and contingent charges including repair	1,029	881	−148
Subscriptions to Agri-Horticultural Society	120	120	...
Total	3,910	3,734	−176
Deficit		3,120	

The expenditure shown under the head contingent charges consists of the following items:—

	Rs.
Repairs of wells, málís' quarters, and vineries	155
„ carts, persian-wheels and jhalárs, &c.	81
Price of a bullock	38
Blankets and bullock-gear	51
Kaisar ploughs	8
Spades and pruning-knives	29
Ropes for wells	52
Gram for bullocks	39
Price of fruit-trees	91
Temporary kúlís	270
Carriage of seeds	31
Subscription to Agri-Horticultural Society, India	36
Total	881

Arrangements have of late been made to sow kíkar and shísham trees in plots of Government land around the Civil Station annually leased to the lessees, along with the seeds they sow for their own benefit, and, as soon as the seeds germinate and the standing crops are carefully removed, it is intended that these plots shall be reserved as fuel preserves. Attempts have also been made to extend the same system to those plots of Government rakhs in which baráni cultivation is allowed, and for which purpose they are also annually leased out to the agriculturists in the district. Certain educated zamíndárs are becoming alive to the advantages of tree-planting and extension of orchards, such as Bháí Rám Dás of

Chak Rámdás, Lálá Amír Chand of Chak Músa, and Sáhib Singh Sapra of Sahiwál. Their orchards, which comprise mango-trees, limes, oranges, dates, grafted ber trees, mulberries, fálsa, &c., are beginning to yield a good income; and as there is no better impetus for moving the minds of natives than money, many who never thought of tree-planting as a source of income will now follow in their wake and put down spare land in trees of this description.

My rule of collecting mango stones is being emulated by others, and we shall some years hence be famous for our mangoes. I introduced the best mangoes in this way into the Siálkot District, which I am given to understand are now yielding a good income. In conclusion, I beg to append translation of a circular I issued to the Tahsíldárs on my resuming charge of this district from furlough, in the hope that it would move them to take an earnest interest in the promotion and extension of arboriculture. I believe that they are now really trying to do what they can, and in my annual tours I personally superintend this very important branch of administration, and never lose an opportunity of introducing new trees into the district. I find the *eucalyptus* thrives well here, but my great difficulty is procuring seed; the bamboo, too, will do well in the Salt Range, and if we can get anything to grow there we shall have achieved a great thing.

Translation of Deputy Commissioner's Circular to all the Tahsíldárs in the Shahpur District.

The rainy season having now approached, all the Tahsíldárs are invited to use their best endeavours to encourage the extension of tree-planting. The land on either side of roads should be ploughed and prepared for this purpose. The trees we wish to increase are mango, kíkar, mulberry, shísham, ber, shirín, pípal and banyan. Available plots of land on roadsides should also be ploughed and planted as nurseries. The trees already growing near the roads should also be looked after as nurseries. Mango stones should be collected in all the larger towns, such as Bhera, Miáni, Shahpur, Chak Nizám and Khusháb, and conservancy sweepers should be rewarded for collecting them. All the available land within municipal limits should be planted with mangoes, and the banks of the canals should be similarly planted. The road leading from sadar to Khusháb is 7 miles, of which 4 miles beyond the city of Shahpur will be in charge of the Tahsíldár of Khusháb, and the remaining 3 miles will be in charge of the Tahsíldár of Shahpur. Double rows of mangoes should be planted along this road. The Tahsíldár of Shahpur will be greatly assisted in planting trees at Sahiwál by Sáhib Singh Sapra, who possesses a good knowledge of this work. Dates should also be planted, and, as it is the season for eating dates, its seed should now be available in abundance. Such fruit-trees afford abundant food for the poor, and also yield a good income. It is hoped all the Municipal Committees will try to increase good fruit-trees within their respective jurisdictions. Plantations should be raised along the circular roads, and oranges and limes of all descriptions should also be planted at suitable sites. Every honest effort made by Government-officials, members of Municipal Committees, and Raíses generally, will be brought to public notice.

MOOLTAN DIVISION.

Remarks by Commissioner.

Having joined the Division about 2½ months after the close of the year, Commissioner has had no opportunity of seeing for himself the work done in this department. From the district reports little work appears to have been done in the Montgomery District. In Muzaffargarh, the high floods on both the Indus and Chenab damaged the young trees by reason of excess moisture and swamping. In Mooltan and Jhang the result was generally favorable to arboriculture.

In Mooltan the attempt made last year to induce zamíndárs to plant kíkar and other hardy trees along the roadside, on the edges of their fields, has proved a failure. Few crops will grow under kíkar trees at all; shade is injurious to crops.

The *eucalyptus* sowing at Mooltan is reported as most successful, and several hundred seedlings will shortly be fit for transplanting.

In Jhang the spoil-banks of the canal, which was cut through the public garden, were levelled, and a nursery of good light soil formed.

The garden is reported to be well stocked with all kinds of fruit-trees, and 9,123 cuttings or seedlings have been raised during the year, chiefly of valuable fruit-trees, such as grapes, mangoes, plantains, &c. These will be sold to zamíndárs to plant at their wells.

In Mooltan and Montgomery no lopping of trees was done during the year. In Mooltan the right to lop the roadside trees was usually leased to a contractor, who worked without any supervision and lopped away as much of a tree as he could. This system injured the roadside trees so seriously that the Deputy Commissioner prevented all lopping this year, and allowed the trees to rest. Moreover, the sparsely-grown trees of our avenues at no time require much lopping.

In Jhang lopping was carried out under the personal supervision of the Tahsíldárs, and the Deputy Commissioner has considerable portions lopped in his presence to show how the work was to be done. It was carried out by daily labor.

The district reports and returns were received in Commissioner's office on the following dates:—

Mooltan	...	21st July 1883.
Jhang	...	21st June 1883.
Montgomery	..	14th ditto
Muzaffargarh	...	4th July 1883.

23.—MOOLTAN DISTRICT.

General Remarks.—The rainfall at each tahsíl was as follows:—

Mooltan	...	9 inches	1	tenth
Shujabad	...	5 „	4	„
Lodhrán	...	7 „	2	„
Mailsi	...	6 „	9	„
Sarai Sidhu	...	11 „	6	„

The result was generally favorable to arboriculture. The attempt made last year to induce the zamíndárs to plant kíkar and other hardy trees along the roadside on the edges of their fields has been, as might have been predicted, a failure. Few crops will grow under kíkar trees at all; shade is injurious to crops. The zamíndárs had no confidence that they would have uncontrolled ownership in the trees.

Description of Work.—The statement of planting is rather a record of what was attempted than of actual results.

The following number of trees were planted:—

Mooltan	... 1,549
Shujabad	... 929
Lodhrán	... 977
Mailsi	... 1,425
Sarai Sidhu	... 411

Of these, 2,251, or 44 per cent., perished.

The greatest successes were the completion of the avenue from the Langeh Khan garden to Daulat gate, and the planting of the open places in the avenues on the sides of the roads in the Civil Lines and around the city of Mooltan.

The railway station road at Lodhrán, and the plantation of the Talamba Sarai, were the only other successes.

The nurseries were stocked with shísham seedlings and bor and pípal cuttings. The *eucalyptus* sowings in the Langeh Khan garden were most successful, and there are several hundred seedlings which will shortly be fit for transplanting. The soldiers' garden was supplied with 50 *eucalyptus* plants.

Establishment and Supervision.—The establishment during the year has been as follows:—

		Rs.
District Funds.		
1 Jamadár at Lodhrán	...	96
1 Máli at Mooltan at Rs. 8 per mensem	...	96
2 Málís—1 at Lodhrán and 1 at Sarai Sidhu—at Rs. 7 each	...	168
4 Málís at Rs. 6 each—3 at Mailsi and 1 at Sarai Sidhu	...	288
7 „ „ 5 „ —4 at Lodhrán, 2 at Mailsi, 1 at Sarai Sidhu		420
2 „ „ 3 „ —1 at Mooltan and 1 at Lodhrán	...	72
1 Málí at Lodhrán	...	18
Municipal Funds.		
4 Málís at Rs. 5 each	...	240
Allowance to head málí at Rs. 2 per mensem	...	24
Total	...	1,422

The supervision has been effected by the Municipal Committee of Mooltan in the Civil Lines and around the city; in other parts of the district by the Tahsíldárs, and by the Deputy Commissioner when on tour.

Financial results.—The expenditure and income were as follows:—

Receipts.		Rs.
Pruning of trees outside of municipal limits	...	67
„ „ within limits	...	64
Total	...	131
Charges.		
Pay of establishment	...	1,422
Donation to Agri-Horticultural Society, Lahore	...	240
Purchase of 5 bullocks for the garden at Lodhrán	...	120
„ a pair of bullocks at Kahror	...	42
Watering trees in the school compound at Sarai Sidhu	...	13
Cost of well gear at Mailsi garden	...	3
„ mahl and lota for Pakhi Mián well	...	3
Conveyance of manure for the garden at Lodhrán	...	1
Purchase of a pair of bullocks for the well at Tibba	...	19
Construction of pakká enclosures within the limit of Mooltan Municipality	...	3,500
Total	...	5,363
Deficit	...	5,232

No lopping was done during the year; I found that it had been the practice to lease the right to lop the roadside trees to a contractor, who worked without any supervision. It was his interest therefore to lop away as much of a tree as he could. This system has punished the roadside trees so severely that I have prevented all lopping this year, and allowed the trees to rest and recover. Besides, the sparsely-grown trees of our avenues at no time require much lopping. Tree-planting in Mooltan dates from 1854 only.

24.—JHANG DISTRICT.

General Remarks.—The rainfall of the year was especially favorable, but, in the best years, falls short of what is sufficient to nourish trees away from wells. Trees, to live in this district, require a supply of water all their lives. There is a remarkable instance in the station itself.

A house which used to be inhabited by successive District Superintendents of Police has for the last two years been without a tenant. Though the water-level is only 20 feet from the surface, the trees in the compound twenty to thirty years old have, with very few exceptions, died, simply because the well is no longer worked.

The fierce dry heat of May and June kills all but the stunted jungle-trees, unless well-water is supplied.

Under these circumstances the planting of avenues, except for short distances in the immediate neighbourhood of wells or in immediate proximity to rivers, would be a waste of money, and arboriculture must be prosecuted in other ways.

The best, in my opinion, is the introduction of better trees at the zamíndárs' wells.

The people of this district are by no means blind to the benefit they get from planting trees.

Five-sixths of the cultivated land of the district is watered by wells, and it is very seldom indeed that a well is to be found without groups or lines of fine trees.

I was much struck in my cold-weather tours by finding that new wells, of which so many are being sunk, now that the settlement is over, had, as a rule, their water-channels planted with young trees, shísham, mulberry, &c.

Th whole cultivated belt on each bank of the rivers is studded with fine trees, and I think our best plan for improving arboriculture is to raise in nurseries valuable trees, such as mangoes, grapes, jáman, simbal, plantain, banyan, pípal, &c., for distribution to the zamíndárs.

The date-palm, too, of which there are large groves in the Shorkot tahsíl, is comparatively unknown in the two northern tahsíls, and I am getting it largely introduced into them.

Description of Work.—1,715 trees were planted out to fill up gaps in avenues, and in making two new avenues, one along a portion of the new canal which runs through the station, and the other on the road from the town of Maghiána to the river-bank, a road which the Hindu population use continually; a portion of this latter road has been lined with fine mango trees, planted at his own expense, by the zamíndár through whose land the road passes.

Of the trees planted in previous years 126 have died.

A large number of the trees planted out this year were of good height, 4 to 5 feet.

The avenues are, with the exception of Kharora avenue, short, disconnected slips, and a sufficient description of each portion will be found in the tabular statement.

The Kharora avenue had become overcrowded with trees, and 100 were felled, to the great improvement of the rest of the trees.

Lopping was carried out under the personal supervision of the Tahsíldárs, and I had considerable portions lopped in my presence at the commencement of the work to show how the work was to be done. It was carried out by daily labor.

Plantations.—The only considerable plantation is that of Sajhowál, a plot of about 350 acres well stocked with shísham. Two years ago I closed the plantation to cattle, and when I visited it about a month ago I was astonished at the improvement effected. Fine young shíshams are growing up in every direction, and large numbers of date-palms are also to be found.

The thinning, which I stated as so much required, has been carried out, and about 500 trees have been felled, many of them good timber trees. They will be sold during the present year, and should realize a handsome sum.

After the rains of last year I put down some maunds of date stones in the sandy sarkana grown tract bordering the town of Jhang on the east and south. The result will not be known till after the approaching rains, but I have every hope that the experiment will prove successful. If it does, the town will have in the course of ten or fifteen years a fine grove of date-palms to replace the sandy waste.

Nurseries.—The spoil-banks of the canal, which was cut through the public garden during the year, were levelled, and make an admirable nursery of good light soil.

The garden is now splendidly stocked with all kinds of fruit-trees, and 9,123 cuttings or seedlings have been raised during the year, chiefly of valuable fruit-trees, such as grapes, mangoes, plantains, jáman, &c.; and these will be sold during the rains to the zamíndárs to plant at their wells. I have had very numerous applications for them. The plantains have been very successful here, and Madras, Bombay and China kinds are ready in great numbers for distribution.

The grapes, too, are of the best kinds, and we had a splendid crop last year.

The mangoes are of the best sorts, got from Lahore, Saháranpur, and the famous tree at Bhakkar near Dera Ismail Khan.

In a few years I trust it will be the exception to find a well without fruit-trees.

The garden at Chiniot is exceedingly well stocked with fruit-trees, the work of a Kashmíri Pandit, who was Tahsíldár there some years ago; and I have indented largely of its supplies to stock the sadar garden.

Establishment and Supervision.—The following is the schedule of establishment and supervision employed for the different works:—

Station garden.

	Rs.
18 Gardeners at Rs. 90 per mensem	1,080

Arboriculture.

25 Gardeners and bhistís, &c., employed on avenues at Rs. 116 per mensem	1,392
Water-suppliers paid annually	455
Total ...	2,927

Supervision was carried on at sadar station garden, as last year, by one head gardener under the immediate control of the Deputy Commissioner. Roadside trees or avenues, groves and other plantations are kept in order by the owners of the wells under the supervision of the Tahsíldárs.

Financial results.—The total expenditure under the head arboriculture amounted to Rs. 5,000, as detailed below:—

	Rs.	A.	P.
Pay of málís and bhistís, &c.	2,472	0	0
Feed of bullocks	300	0	0
Improvement of station garden	900	0	0
Purchasing plants	131	0	0
Subscription to Agri-Horticultural Society, Punjab	120	0	0
Miscellaneous expenditure	1,077	0	0
Total ...	5,000	0	0

The receipts were Rs. 285-3-2, as shown below:—

Garden produce	204	1	11
Sale proceeds of loppings	81	1	3
Total ...	285	3	2
Deficit ...	4,714	12	10

The decrease of Rs. 215-4-4 is due to the fact that the sale proceeds of the loppings sold by the Tahsíldár, Jhang, have not yet been realized, for the recovery of which measures are being adopted.

The income will largely increase next year, and the increase will, I hope, be permanent. It has taken some time to fully stock the sadar garden with good fruit-trees, but, now this has been done, a handsome profit may be expected from the sale of fruit and of fruit-trees to the zamíndárs.

25.—MONTGOMERY DISTRICT.

General Remarks.—Rainfall—

	1881-82	1882-83
Montgomery	11·4	12·2
Gugera	19·7	12·4
Dipálpur	16·6	13·7
Pákpattan	13·9	7·4
Total ...	61·6	45·7

The rainfall during the year under report was much less than in the preceding year; thus the planting of trees was not carried out to any great extent.

Fires.—Nil.

Description of Work: Avenues.—The work carried out was planting of fresh and the maintenance of existing trees. Avenues have been planted along 2 miles of road, and the gaps in 3 roads filled up: 2,199 trees have been planted. The following are the principal roads in this district, and a large portion of them remains unplanted, *viz.*:—

Montgomery to Pákpattan.
Okára to Fázilka.
Montgomery to Gugera.

These are due chiefly to scarcity of water along the roadside.

No lopping of trees was carried on during the year under report.

Groves, plantations and nurseries.—There are only two groves, at Gugera and Atári; at both these the trees are large and require no particular care.

Establishment and Supervision.—The following establishment was maintained during the year, and the expenditure thereon amounted to Rs. 961, as follows :—

		Rs.
1 Contractor for watering trees	at Chichawatni ...	120
1 „ „	at Dipálpur ...	120
1 „ „	at Gugera ...	60
1 „ „	at Okára ...	30
Málís, kúlís, bhistís, at sadar	...	631
	Total ...	961

The establishment at sadar has worked under the supervision of the Secretary, District Committee, and those in tahsíls under that of Tahsíldárs.

Financial results.—There were no receipts from arboriculture. The charge was as follows:—

	Rs.
Maintenance of establishment as detailed above ...	961
Other expenses, such as cleaning wells, cutting grass of dák-bungalows, construction of nálís for arboricultural purposes, and planting trees, &c. ...	566
Total charges ...	1,527

26.—MUZAFFARGARH DISTRICT.

General Remarks.—The special feature of the year was the high floods on both the Indus and Chenab, which did damage by reason of excess of moisture and swamping the young trees. At the same time the subsequent effect of such an inundation would probably be beneficial to those trees whose roots were firmly planted.

Last year's report may be referred to as showing the general circumstances of arboriculture in this district. To me, coming as a stranger into Muzaffargarh, I can only say that the height and vigour and shade of the trees planted by the successive District Officers afford a delighted surprise. No doubt the soil is *shor* in many parts, but the abundant supply of running-water in the hot months of the year is enough to counterbalance this.

Description of Work.—The operations of the past year in themselves may be summed up as follows, their relative effect as following on former years being shown in the usual statement :—

(*a*). On roadsides 19,064 trees, mostly shísham, were planted; of these, 13,577 are reported as having withered, and 5,487 as still thriving.

(*b*). In groves and plantations, besides sowing a large extent of land in various parts with seed, 51,941 trees are reported as having been planted, of which 51,721 are thriving. Even allowing for future reverses and failures in the rearing of these young plants, this represents a substantial progress in the propagation of shade and timber.

The planting on roads was not so successful as it might have been. In some cases, as in Alípur, the schemes were too ambitious. I would suggest, for the consideration of the Commissioner and the officer in permanent charge of the district, that it would be better to proceed on a more regular scheme in this matter than appears to obtain at present. Other things being equal, it is more important and more beneficial to plant the roads radiating from the sadar station toward the different tahsíls, than any others. Till they are done, it would seem wise to restrict other roadside plantings. Again, in the tahsíls only so much planting should be attempted as the Tahsíldár can *thoroughly* supervise, and the lines of road chosen should, I think, be those leading to the sadar. It is obvious that the more shade we get near the centre of the district the more persons are benefited by it; and, in estimating comparative results in this matter, I think it should be remembered that success in planting sandy sunbaked roads is really a greater achievement than in obtaining a large number of trees in a part where the heat is less terrible to the traveller. The only condition is that a little be attempted and well done.

Establishment and Supervision.—Nothing reported.

Receipts ...	Rs.	*Nil.*
Charges ...	„	8,466 12 0
Deficit ...	„	8,466 12 0

Financial results.—The expenditure was Rs. 8,466-12, according to the sanctioned budget, being less than 1881-82 by Rs. 625. The only items which seem to require notice are:—

(*a*). Rs. 400 for making improvements in the plot of land lying round the new building which is to be the joint Municipal and District Funds Committee house. This work to any one coming into the station is seen at once to be good.

(*b*). Rs. 240 subscription to the Agri-Horticultural Society, Lahore. It may be doubted that whether what is obtained for this subscription is worth the money. Efforts will, however, be made this year to make the most of it, or perhaps it may with advantage be diminished to Rs. 120.

The ravages of the *tela* insect on the mango-trees continue; and the Taliri garden sustained further damage from the river floods, which were with difficulty kept away from the Civil Station and town of Muzaffargarh.

DERAJAT DIVISION.

Remarks by Commissioner.

Dera Gházi Khan.—In the Dera Gházi Khan District, Mr. Fryer, Deputy Commissioner, takes great interest in arboriculture, and has received great assistance in this department from Mr. Nulty, Head Clerk and Secretary to District and Municipal Committees.

The mango thrives well in this district; the forming of mango groves is a good idea, and hereafter this and other fruit-trees of larger kinds, such as jáman, might be planted on roadsides between the other trees.

Pines and firs will certainly thrive in the hills if the people will let them grow.

Bannu.—As regards the irrigated part of the Bannu District, especially the Bannu tahsíl, there should be complete avenues as far as the water runs. The Deputy Commissioner's attention will be called to this.

On the main road, Edwardes-abad to Peyzu by Ghazni Khel, the care of trees is under the Department Public Works; but, under this system of management, neither extension, maintenance nor reproduction of trees is efficiently carried out.

Future plan of operation.—My working plan for 1883-84 is only to plant good seedlings where there is water, *viz.*, on Tánk road and near sadar and below Bhakkar, also round new tanks under construction on the Dera-Bannu road. For the Thal roads, Cis-Indus, the plan is to encourage zamíndárs to plant avenues and groves near their wells. This plan has been followed systematically for years with great success.

27.—DERA ISMAIL KHAN DISTRICT.

General Remarks.—The rainfall varies from 8·90 to 16·10 inches, and is quite insufficient for arboricultural purposes; six-sevenths of the fall of the year fell in July and August last. After that no rain fell for some months; about 5 inches fell in the next seven months.

Description of Work: Trunk road from Dera Ismail Khan to Bannu.—This road is 36 miles in length in this district, out of which 3 miles were planted in the previous years and one mile in the year under report. 653 trees were planted, out of which 95 per cent. were successful. The trees planted in former years were in pretty good condition.

Dera and Tánk road.—Length of road is 40 miles, of which 10 miles were planted in previous years and 3 in 1882-83. Of the trees planted during the year, 91 per cent. were successful, *i.e.*, 2,831 trees were planted in all, of which 2,591 are living. The constant flow of water along a part of the road keeps the trees planted in a flourishing state.

Kallúrkot and Kot Sultán.—The road is 118 miles in length, of which 20 miles were planted in former years and one mile in the year under review. 2,147 trees were planted during this year, out of which 167 died, so that 92 per cent. were successful. The living trees are doing well.

Bhakkar and Jhang road.—The length of the road is 44 miles, of which 9 miles were planted in previous years and one mile in 1882-83. 7,693 pegs of tamarisk and ber trees were planted along this road, out of which 450 died, *i.e.*, 94 per cent. were successful.

Groves.—The number of groves is the same as last year, *viz.*, 44. The trees are grown-up and are unfit for transplanting purposes. Only 272 trees were planted during the year under report, but all of these trees died from want of water.

Establishment and Supervision.—The following permanent establishment was employed during the year:—

1	Daroga	at Rs.	25	per mensem.	
1	„	„	20	„	
3	Málís	„	6	„	each.
14	„	„	5	„	
1	„	„	4½	„	

Supervision was carried on near the sadar station by one head gardener under the immediate control of the Deputy Commissioner. The Tahsíldárs exercise the necessary supervision in their respective iláḳás.

Financial results.—There was no income during the year. The expenditure amounts to Rs. 2,130-0-1 as against Rs. 1,691-10-11 in the previous year. The increased expenditure is owing to greater length of roadway being planted.

Receipts	... Rs.	*Nil*	
Charges	... „	2,130	0 1
Deficit	... „	2,130	0 1

The lopping of branches is usually carried out by the permanent establishment assisted by hired carpenters and kúlís. On roads recently planted the trees are too young to require lopping, but those of some years' standing have been lopped, and proceeds from this source amounted to Rs. 60; but, as it was not sold till after the close of the year, the sum will be shown in the accounts of the current year, 1883-84, on realization. Lopping is done by axe for small branches and twigs, and by saw where larger.

28.—DERA GHAZI KHAN DISTRICT.

General Remarks.—Nil.

Description of Work.—During the year under report roadside avenues were extended by 8¾ miles—6¾ miles in the Dera and 2 miles in the Rájanpur tahsíl.

On the road leading from the station to Dera Ismail Khan the extension was for a distance of half a mile; 4½ miles were planted in previous years, thus making in all 5 miles planted.

One mile of the extension was on the Sherú road. This road is now planted for a distance of 8½ miles.

The road from Dera to Jámpur (the Jámpur section of the Rájanpur road) was extended by half a mile, making in all 16½ miles planted.

On the road from the station to Vidor the extension was for a distance of half a mile.

This road is now planted for 3 miles.

In addition to the extension of the above avenues during the year, the following roads had avenues planted along them to a certain length for the first time:—

Harrandwála road, leading from the back of the city to the river				2	miles
Yáru road	...	...	...	1½	„
Road from Kot Chutta to Choti	...	...	...	1	„

In the Rájanpur tahsíl the extension of 1 mile was on the Hamúwála section of the Rájanpur road, ½ mile on the Rájanpur circular road, and ½ mile on the Hájipur road.

The number of trees planted on these 8¾ miles was 2,625, almost all shísham. A little kíkar had to be planted on such lands as were impregnated with *kallar*.

The mango grove planted last year on the Rájanpur road half-way between Dera Gházi Khan and Kot Chutta is doing well. Another roadside mango grove was planted out during the year under report on the Bátil road, half-way between Dera Gházi Khan and Bátil.

The number of nurseries maintained for obtaining supplies of plants for roadside avenues was the same as last year.

3 on the Kot Chutta road;
1 on the Sherú road;
1 on the Sakhi Sarwar road;
1 on the Dera Ismail Khan road.

In addition to these nurseries the plantation at Kot Haibat was largely extended by about 30 acres, or an area equal to that extended in previous years. The plantation is now assuming the appearance of an extensive shísham preserve or rakh. During the year under report, some 5,000 trees were newly planted in this rakh—almost all shísham, with the exception of a few fruit-trees, such as mangoes, jámans, mulberries, &c., that were planted here and there.

As an experiment, about three or four hundred young carobs and mesquits were planted out in the rakh. Saccharum grass grows of its own accord very luxuriantly in the plantation, and as guinea grass grows quite as luxuriantly as saccharum when well irrigated, roots of guinea grass have been extensively planted in the rakh, where there is a continual flow of canal-water from April to September. If the guinea grass thus planted does well, a fodder plant of great value will have been introduced in a way requiring little or no culture.

Two large nurseries of fruit-trees were maintained, as hitherto, in the Government and Kacheri gardens, from which mango, jáman, peach, plum, pomegranate, lime, citron, fig, and vines, continental and others, of the best varieties—such as muscat of Alexandria and other muscatels—were distributed gratis to zamíndárs. In all, about 4,000 trees were thus distributed. The demand for fruit-trees is becoming so large, especially for peaches, which are budded and then given out, that the supply can hardly be made equal to the demand.

The gardens are doing splendidly at Fort Munro. During the year under report a portion of the Fort Munro hill has been planted with gums and poplars, which it is hoped will do well.

One blue gum (*Eucalyptus globulus*) planted about five years back on the top of the hill is now a fine big tree, and a number of olives then planted are doing well but making very slow growth.

In the garden, a little lower down, the olives planted some years back are now bearing fairly. Pines and firs are being propagated from seed for plantation on hill tops and slopes.

These plants are, however, very slow growers, and a supply fit for planting out cannot be expected for the next two or three years.

Lopping.—The roadside avenues of this district are young yet, and very little lopping is resorted to; any lopping that may be needed is done by the roadside establishment, which consists of bhistís who are well trained to planting, lopping, &c.; the latter being carefully done, so as not to leave stumps which eventually injure the tree.

Establishment and Supervision.—The number of bhistís employed on roads is 48.

Receipts	... Rs.	*Nil*
Charges	... „	7,054
Deficit	... „	7,054

Financial results.—The expenditure during the year from all sources (District, Municipal and Provincial) amounted to Rs. 7,054.

29.—BANNU DISTRICT.

General Remarks.—The rainfall was less at Bannu and Laki, and more at Isa Khel and Miánwáli, than the preceding year. Nothing more particular to be mentioned.

Description of Work: Bannu.—1,780 trees were planted during the year—700 with success, or 40 per cent. These were planted to fill up the blanks or gaps in roadside trees.

Laki.—No special report from the Tahsíldár.

Isa Khel.—335 trees planted during the year on roads, of which 45 died; and 940 elsewhere, of these 300 died, leaving 930 with success, or 70 per cent.

Miánwáli.—180 planted during the year—43 died and 137 with success, or 75 cent. These were planted both on roads and elsewhere. Care was taken to lop the trees in December, and Rs. 25 were realized by sale of branches of trees collected in thinning out the trees.

Establishment and Supervision.—There were 15 málís on roadside trees for more than half the year, when the number was decreased by one; two were in the station garden at Miánwáli; and one at the nursery at Naurang well—in all 18.

Financial results.—The following is a detail of receipts and charges for 1882-83 :—

Receipts.

Sale of trees	...	...	... Rs.	25 0 0

Charges.

Establishment	...	...	... „	1,070 11 11
Contingencies	...	...	... „	94 14 0
		Total	... „	1,165 9 11
		Deficit	... „	1,140 9 11

PESHAWAR DIVISION.

Remarks by Commissioner.

Pesháwar.— As usual in Pesháwar, the Deputy Commissioner, Mr. Beckett, has done a great deal of roadside planting—20,000 trees at the cost of about Rs. 3,800 in establishment, supervised by the Tahsíldárs. No great income accrues as yet from lopping, but Rs. 250 were secured by this and sale of grass, reducing the cost to Rs. 3,550, and Rs. 1,700 were realized by sale of grass and seeds and credited to the Forest Department.

Hazára.—In Hazára there has not been much planting-out, and the roads in the vicinity of Abbott-abad have been chiefly cared for. This is correct, as the work should advance from this centre. The main roads of the district are all under the Public Works Department, and the other roads are not suitable as a rule for roadside avenues.

Much has been done in growing young trees in pots, and no doubt this system, though expensive, will be successful. More might be done by sowing *Primus longifolio* in patches at intervals, when they are easily transplanted.

				Rs.
Receipts	...	...	...	3,000
Charges	...	...	...	1,800
	Deficit	...	...	1,200

Kohát.—In Kohát there are difficulties. It would be impossible, save at a prohibitive expense, to save roadside avenues from the drivers of carriage animals that crowd along the roads. The vicinity of the station is rightly dealt with first, and it must be recollected that the sum at the disposal of the Deputy Commissioner was but Rs. 327. Some 600 trees were planted. *Eucalyptus* seems likely to suit the soil.

30.—PESHAWAR DISTRICT.

General Remarks.—The new trees planted out were successful. No heavy rain or drought affected the arboriculture during the year under report. The lopping of trees was done by the gardeners (málís) under the supervision of the Tahsíldárs.

Operation of the year.—19,466 trees of various descriptions were planted out during the year at a cost of Rs. 3,786 against Rs. 4,652, or Rs. 866 below the expenditure of the previous year. This decrease was due to the reduction of unnecessary establishment. The following is the detail of trees planted out on district roads :—

Tahsíl Pesháwar.

Nissutta	road	...	...	...	1,000
Bára	„	...	...	...	800
Circular	„	...	...	...	1,500
Urmar	„	...	...	...	700
Fandu	„	...	...	...	600
Idgah	„	...	...	...	400
Jhíl	„	...	...	...	200
Garhi Sardár	„	...	...	...	200
Bhonamari	„	...	...	...	300
Chorperiza	„	...	...	...	500
			Total	...	6,200

Tahsíl Mardán.

Shahbáz Gara road	...	...	350
Púr Muli „	...	...	960
Jelálá „	...	...	800
Mangán „	...	...	200
Dasera „	...	...	850
Gari Kapúra „	...	...	400
Akora „	...	...	100
Rustam „	...	...	150
Dispensary „	...	...	250
Rushkai „	...	...	780
Hoti „	...	...	560
Kalpani „	...	...	560
	Total	...	5,960

Tahsíl Utmán Bolák.

Topi road	...	...	300
Swabi to Maneri „	...	...	210
Jehangira to Lahore „	...	...	600
	Total	...	1,110

Tahsíl Hashtnagar.

Kheshki to Abázai road		...	150
Chársadda to Nissutta „		...	954
Do. to Prong „		...	132
Do. to Gari Haved Gul „		...	160
	Total	...	1,396

Tahsíl Doaba Daúdzai.

Mardán road	...	...	600
Hashtnagar „	...	...	400
Charperiza „	...	...	800
Mathrá „	...	...	300
Darbangi „	...	...	900
Michni „	...	...	600
Sarikh „	...	...	500
Kángra „	...	...	700
	Total	...	4,800
	Grand total	...	19,466

The trees planted out were in good order. They were in need of water in the summer, when *mashaks* (water-bags) were supplied to the málís for the purpose of watering trees. Not less than 82 per cent. were successful during the year under review.

Establishment and Supervision.—The strength and cost of the establishment employed for the different works were as follows:—

					Rs.	A.	P.
1 Daroga	at Rs. 60	per mensem	for 4 months	...	240	0	0
1 Jamadár	„ 12	„	„ 7 „	...	84	0	0
2 Jamadárs	„ 10	„	„ a year	...	240	0	0
2 „	„ 10	„	„ a month	...	20	0	0
1 Málí	„ 9	„	„ 7 months	...	63	0	0
2 Málís	„ 7	„	„ a year	...	168	0	0
20 „	„ 6	„	„ „	...	1,440	0	0
21 „	„ 5	„	„ „	...	1,260	0	0
1 „	„ 4	„	„ „	...	48	0	0
3 „	„ 2	„	„ 8½ months	...	50	12	1
Purchase of young seedlings				...	136	0	6
Purchase of kíkar seed	...		...	...	4	15	3
Well for watering trees	...		...	...	30	0	0
Cutting tree-branches	...		...	...	1	12	0
			Total	...	3,786	7	10

The above establishment was supervised by the Tahsíldárs of the district as well as by the members of the District Fund Committee in their respective iláká̄s, to whom the work of tree-planting was intrusted.

Financial results.—The following is the detail of receipts and charges of the year :—

		Rs.	A.	P.
Receipts—Sale proceeds of tree-branches and grass	...	253	10	6
Charges—vide detail given above	...	3,786	7	10
Deficit	...	3,532	13	4

Jhíl Plantation.—As requested by the Conservator of Forests, Punjab, I append a note of receipts and expenditure on account of this plantation :—

Receipts.

Received from the Assistant Conservator of Forests, Punjab	Rs.
... ...	192

Charges.

1 Jamadár at Rs. 10 per mensem	120
1 Chaukídár „ 6 „	72
Total	192
Balance ...	*Nil*

Rs. 1,694 were realized on account of sale proceeds of grass, reeds, &c., and credited to Government under the head "Forests Remittances." This was Rs. 638 more than the income of the previous year.

31.—HAZARA DISTRICT.

General Remarks.—During the year under report the old system of rooting up young trees and planting them out has been changed, and the trees were properly transplanted with a ball of earth round the roots. Fewer trees were planted, but with more satisfactory results, than hitherto. Pot culture has been carried out in the Abbott-abad garden with good results, and it is hoped that the trees planted out from the pots as soon as they are large enough will give still better results.

Rainfall was good at the planting season, and the dry season was not very severe. The heavy snowfall during the winter killed many young trees and injured many full-grown trees, notably the *eucalypti*.

Description of Work.—One mile of road was planted and gaps were filled up in 14¼ miles of roadside avenues, and 2 acres and 10 poles were planted with young trees. In the Abbott-abad gardens some 11,000 pots are filled with young trees after distributing some 3,000 young trees over the district.

Establishment and Supervision.—The establishment will be shown below. The Abbott-abad garden was under the Assistant Commissioner and Deputy Commissioner.

The Haripur gardens, and the nurseries at Shinkiára and Mansahra, were under the Tahsíldárs.

Financial results.—

Receipts.

	Rs.
Grass	103
Vegetables and fruits	1,723
Loppings	8
Total ...	1,834

Charges.

District Funds—	
4 Málís	564
Contingencies	496
Annual subscription to Agri-Horticultural Society	120
Municipal—	
18 Málís and contingencies	1,761
Total ...	2,941
Deficit ...	1,107

32.—KOHAT DISTRICT.

General Remarks.—Nothing special occurred during the year under report. The rainfall amounted to 20·7. Though it was more than the average and sufficient for plantation purposes, very little has been done in this respect on account of the small contribution obtainable from the District Funds, and the unfavorable nature of the soil, which is too stony to admit of planting-out to any great extent. The recent plantation of trees has been mostly on the roads in the vicinity of Kohát. The following table, which shows the detail of expenditure from the District Funds divided under several heads out of the total allotment of Rs. 7,554 for the year 1882-23, is given for information:—

Heads		Actual expenditure, 1882-83
		Rs.
Office establishment and contingencies	...	817
Clerk in Commissioner's Office	...	120
Arboriculture	...	327
Education	...	1,318
Vaccination	...	638
Medical—English medicines	...	4
District sanitation	...	155
Sarai establishment	...	222
Public Works charges	...	3,555
Total Rs.	...	7,156

Description of Work.—The work carried out was very small. The circular road, which was planted in the previous year, was replanted in the year under report, and the gaps were filled, as a number of trees planted in the previous year had succumbed from want of water and the unpromising nature of the soil. The municipal and the tahsíl gardens, as well as the road from the Post Office to the bottom of the Station Hospital Hill, were also planted with a few young trees. The trees that survived from 1881-82, and those planted in 1882-83, are in good condition and are thriving.

The following table will show the number and the species of young trees planted during the year under report on roads and elsewhere:—

Locality	*Eucalyptus* seedlings	Shisham	Mulberry	Sarin	Bar	Kuliyar	Total
Circular road ...	68	364	5	4	3	...	444
Road from Post Office to the bottom of Station Hospital Hill ...	4	3	21	...	...	...	28
Municipal garden ...	2	79	16	1	...	11	109
Tahsíl garden ...	...	2	3	...	...	...	5
Total ...	74	448	45	5	3	11	586
Number of trees died ...	...	112	3	...	1	...	116
Percentage of successful trees ...	80						

Eucalyptus seedlings, when experimentally planted in the municipal garden in 1881, were found to be successful and suited to the soil. A few were got from the Agri-Horticultural Society, Lahore, and planted during the year under report. It is intended, however, to get a larger number in the current year for plantation on the roads round the city, as far as funds permit. Out of the total number of 586 trees planted, 472 were planted in avenues and 114 in plantations.

Establishment and Supervision.—The following establishment was kept for arboricultural purposes during the year under report:—

3 Málís at Rs. 5 each per mensem ... Rs. 15
2 Bhistís—1 at Rs. 6 and 1 at Re. 1 ... „ 7 } 22 per mensem = Rs. 264 per annum.

Financial results.—There have been no receipts during the year under report from pruning. The lopping is carried out under the supervision of the Assistant Commissioner and the Tahsíldár of Kohát. The charges incurred from the District Funds for establishment and contingencies amounted to Rs. 326-10-6.

Receipts ...	Rs.	*Nil*
Expenditure ...	„	326 10 6
Deficit...	„	326 10 6

II.—CANAL ARBORICULTURE.

1.—1ST DIVISION, BARI DOAB CANAL.

General Remarks.—The rainfall in the 1st sub-division was much below the average of the last seventeen years, while that in the 2nd sub-division was above the average for the last seventeen years, and was beneficial to the young trees.

Description of Work: Plantations.—The land available for plantations on the Main canal and Main Branch Upper has all been planted out, with the exception of places where the soil does not admit of profitable arboriculture. In some parts the plantations are ready for working, and some 75,000 maunds of fuel and 14,000 cubic feet of timber have been cut during the year for sale to the Amritsar and Pathánkot Railway Contractors. This is much above what the plantations can annually yield, but the circumstances were exceptional.

Proposals for the future.—In future it is proposed to work the fuel in a twenty years' rotation, and the timber by selection. Each portion cleared will be re-sown at once with the kinds of trees which experience has shown to be most suitable to the locality.

Avenues.—Gaps in the avenues have been filled up; about 800 trees have been planted in the avenues for this purpose. Of these, about 400 have been planted in the avenue from Kila Lál Singh to Aliwál, where the alternate trees (siris in all cases) have been removed and replaced by mango and jáman.

Kasur and Sobraon Branches.—One mile of Kasur Branch below Bhorwál was planted during the year on both banks. The dead trees in chauki compounds were renewed. No other new planting done during the year.

Establishment and Supervision.—On the Main line and Main Branch Upper, the establishment employed consisted of one máli at Rs. 7, two at Rs. 6 and one at Rs. 5 per mensem, or four málís at Rs. 24 per mensem. One bhistí for six months and five for three months.

On the Kasur branch, above Grand Trunk Road, one málí at Rs. 6 and nine beldárs at Rs. 5 were employed for watering the trees from watercourses. On the Sobraon Branch, from the head to the Grand Trunk Road, one málí at Rs. 6 and nine beldárs at Rs. 5 a month were employed.

Special temporary establishment was employed for watering the plantations that could not be done by watercourses.

There is no plantation on the Sobraon Branch below Grand Trunk Road.

General supervision is done by Executive Engineer, sub-divisional officers and subordinates.

Financial results.—On the old parts of the Canal, the Main canal, and Main Branch Upper, the expenditure was—

	Rs.
Planting-out	789
Maintenance	501
Cutting fuel for sale, and other miscellaneous charges	4,159
Total ...	5,449
The receipts amounted to	9,250

On the branches, the expenditure was—

Planting-out	1,170
Maintenance	1,958
Total ...	3,128
The receipts amounted to	65
The total expenditure on all parts was ...	8,577
„ receipts „ ...	9,315

2.—2ND DIVISION, BARI DOAB CANAL.

General Remarks.—The operations for the year have been somewhat extensive, and comprise maintenance of existing plantations, completion of avenues, formation of nurseries, thinning some plantations, and the total felling of others.

Description of Work: Avenue trees.—The canal line or avenue on both sides was maintained as usual; several trees die annually from chlorosis, or from an insect supposed to resemble the larva of a cockroach which attacks their roots. Many trees are blown down or broken short. Most damage is done to the trees where the land lies low in comparison to those growing on the higher loamy soils. On the Lahore canal 350 pits were dug for the purpose of refilling the gaps. On the Main Branch Lower about 400 trees were planted, of which 90 per cent. are said to have survived. Many of these unfortunately are cropped by cattle who break through all ordinary fences.

Chauki compounds.—These are well maintained, and in many localities are furnished with some splendid trees. They are tended by the watchmen, who are usually málís, whose duty it also is to sow seeds in nurseries and provide plants for the avenues. Thus a lot of mango plants have been put out on the canal in the neighbourhood of Amritsar, which are doing well. In the Niázbeg compound a fence was made of hill privet (alier) which has been fairly successful. For the purpose of fencing line trees a ring of the common cactus appears serviceable and sightly. However, it will only grow in well-moistured ground. On the Lahore Branch the compounds at Niázbeg, Tulspur, Bhargil and Fatahgarh were replanted; and on the Main Branch Lower additional trees were planted or seed sown in Rájajang, Bedián and Hibban. A new description of lift on the "chambal" plan was put up at Gilpan chauki.

Fuel plantations.—At Niázbeg about 5 acres of shísham have been sown and fenced with wire. On the Main Branch Lower 17,800 lineal feet of wire-fencing were constructed at a cost of Rs. 1,847, or somewhat over Rs. 10 per 100 feet. The plan is a double wire on wooden props standing on a fence with a wide deep ditch outside. The fence is planted with bamboo aloes (yucca) which grow fairly and will allow of the wire being removed to elsewhere after a year or two. On the Main Branch Lower 35 acres of trench and ridge plantation were sown, and have been successful on the whole. Two acres at Jagatpur are said not to have germinated for want of watering, but the seeds may come up after the rains have moistened the earth.

Thinning operations.—Between Amritsar and the boundary of the Lahore District 500 maunds of fuel were got from the plantations, and from Rájajang to Gundian 5,000 maunds were obtained which sold at about Rs. 15 per 100 maunds. This plantation is about ten years old, and can bear another thinning next year.

The upper part of the old Hasli and part called the Kaluwál Dahanah have been entirely denuded of trees, so also have the Nág Rajbáha and the portion of abandoned channel at Dudian. It was thought advisable to sell the wood, which is chiefly mulberry and shísham, as there was a good demand for timber and fuel for the Pathánkot Railway. It is not expected that this wood will coppice, as the trees were mostly well-grown.

Establishment.—The plantations are tended by permanent málís, some of whom are experienced in arboriculture, and monthly laborers. The following is the scale maintained :—

	Málís @ Rs. 6.	*Beldárs @ Rs. 5.*
1st sub-division ...	1	4
2nd " ...	3	14
3rd " ...	5	27
Total ...	9	45

The financial result shows a profit on the year's operations, but, unless the interest on capital sunk up to date be also included, the actual state of profit and loss cannot be seen.

Receipts.

	Rs.	A.	P.
By sale of wood ...	} Details not kept.		
" " grass ...			
" " fruit ...			
Total ...	24,471	2	1

Charges.

Establishment	3,477	0	1
Planting operations	1,618	15	0
Wire-fencing	2,662	13	5
	7,758	12	6
Balance profit ...	16,712	5	7

3.—UPPER SUTLEJ CANAL.

General Remarks.—The supply in the canals being favorable the trees on the banks received a good watering.

The overhanging trees on the Khanwah Canal between Nijábat and Nathu Shah were cut and jungle cleared at a cost of Rs. 1,174-12-0.

Description of Work.—The trees on the canals are of spontaneous growth. The trees planted in the compounds of the Gudar Malkána, Lola, Ladhewál, Bunga Hyat and Ladian chaukís a few years ago were tended and watered during the year.

Establishment.—Five bhistís at Rs. 5 each per mensem were employed during the year, one for each chauki compound mentioned above. Their work was supervised by the subordinates in charge of the canals.

Financial results.—The income derived during the year was as follows :—

		Rs.	A.	P.
By sale of wood	... ...	1,415	4	4
„ grass	... ...	1,606	12	3
Total	...	3,022	0	7
Deduct charges	... ...	1,576	3	11
Net profit	...	1,445	12	8

These canals, running in almost rainless districts and carrying a supply of water during only a portion of the year, cannot have their banks and spoils planted out systematically without a large expenditure which the capital accounts cannot sustain.

The value of fuel and timber in this part of the country is so low that the cost would be more than the worth of the plantation. The chief part of the income in this Division is derived from the sale of sarkanda grass, of which there is a copious growth on these canals, and which is in much demand by the zamíndárs.

4.—LOWER SUTLEJ AND CHENAB DIVISION, INUNDATION CANALS.

General Remarks.—No new planting operations have been undertaken during the year. It is useless planting trees upon the canal spoil-banks, as they would be destroyed during the annual clearances. In nearly all of the chauki compounds where water is available there are already a sufficient number of trees.

Description of Work.—Watering trees on the Chenab bund and in chauki compounds. For the former bhistís have still to be employed. The trees in the chauki compounds are watered by jhalárs and wells.

Establishment and Supervision.—1 mate at Rs. 8 and 12 beldárs for 6 months on the Chenab band; 6 beldárs at Rs. 6 and 3 at Rs. 5 for 12 months for chauki compounds.

One pair of bullocks for 12 months at Rs. 15 per mensem for Kehror compound, and the same for Shujabad.

Financial results.—

Receipts.

	Rs.	A.	P.
Sale of wood	3,531	7	9
„ lúng and sarkana ...	3,214	7	0
„ fruit	102	7	0
„ crops	4	13	0
Total ...	6,853	2	9

Charges.

	Rs.	A.	P.
Watering trees, &c. ...	2,248	9	9
Surplus	4,604	9	0

5.—DERA GHAZI KHAN DIVISION, INDUS CANAL.

General Remarks.—The rainfall was far in excess of the average of the last few years.

Description of Work.—During the year 14¼ miles of new avenues were planted. In the previously existing avenues (the length of which was 115$\frac{9}{20}$ miles) the young trees were watered and protected, and gaps in the lines filled up. Altogether 8,007 trees were planted

during the year. The number of trees which died during the year was 2,087, some of which were planted this year and some a year or two earlier. During the last seven years the total number of trees planted was 52,429, and the number which died was 26,988. Seedlings for planting-out were grown in the bungalow compounds, but no trees were planted in them (as they are already sufficiently planted) or in any other plots. The trees in the avenues and compounds were thinned out where necessary. The total area under plantations is 1,466·20 acres.

Establishment and Supervision.—The establishment consisted of 4 málís and generally about 26 bhistís, who are supervised by mates and also by the sub-overseers and sub-divisional officers.

Financial results.—The expenditure during the year was Rs. 3,006, and the receipts (chiefly from sale of timber) Rs. 402, the net loss being therefore Rs. 2,604. The receipts last year were very much greater owing to large quantities of timber having been supplied to the Military authorities for the construction of cavalry lines. The total expenditure which has been incurred on plantations since operations were first commenced in this Division, about twenty years ago, is Rs. 57,394, and the total receipts have been Rs. 16,267. These receipts are, however, chiefly on account of sales of self-sown trees, and are not really a set-off to the expenditure. The total number of *planted* trees in the Division which are of such size as no longer to require watering, &c., is about 33,000. Scarcely any further expenditure will be incurred on them, and few deaths are likely to occur among them. There are also 24,624 young trees which still require watering. About 80 per cent. of the trees are shísham. Taking the larger trees alone, the expenditure has been at the rate of Rs. 1·74 per tree. If to this be added interest for the number of years which elapse before a tree is full-grown and fit for timber, the cost will be three or four times as much; but even this will be considerably less than the value of the tree when full-grown. The bulk of the trees have been planted since 1873, and are therefore still quite unfit for timber. In many places the trees were formerly planted only 10 feet apart, and it has been necessary to thin them out; but the trees cut were almost worthless, so that most of the money spent on them was wasted. They are now planted 20 or 25 feet apart. The river has also of late years cut away considerable lengths of embankments and canal-heads where trees had been planted.

6.—MAIN LINE DIVISION, SIRHIND CANAL.

Description of Work.—Little was done on the Main line during the year under report, the principal operation consisting in the sowing of 80 acres of spoil-banks on the Budki and Siswan torrents.

The spoil-banks have been sown with kíkar and shísham, and the young trees are looking well and strong.

A few avenue trees were planted here and there, but nothing of an extensive nature was attempted.

The plantations have been thinned where overcrowded, but a great deal more thinning is still needed.

The return called for is attached.

7.—3RD DIVISION, SIRHIND CANAL.

Description of Works: Abohar Branch.—Until the middle of January 1883 no expenditure was incurred on the plantation along this Branch. In that month, however, a commencement was made and over 250 acres were sown with shísham seed in pits. About one-sixth germinated, and of this three-fourths died during the hot weather from want of water. As the canal was closed all through March and April, and again during the latter half of May, it was impossible in many reaches to obtain any water at all, and wherever this was the case the seedlings died off rapidly.

A good many avenue trees were planted out during January, but many of these too have died from want of water.

The fencing of canal land with aloe plants was begun, about 20,000 having been planted along the dowel bordering the boundary road. Of these plants a great many have been lost owing to the hot-weather storms sweeping away the dowels where of a sandy nature. About 12,000 remain and are growing well.

Bhathinda Branch.—Sowing in freshly thrown up spoil-banks was commenced in June 1882 after the first fall of rain, and about 10½ miles of spoil were sown with kíkar and shísham. Of this none germinated during the rains, but at the commencement of the present hot weather about one-eighth of the whole area planted came up, and the young plants are now about two inches high.

An aloe hedge was planted for about 6 miles and, as on the Abohar Branch, has grown well, except where the dowel has been destroyed by storms.

General Remarks.—Nurseries were started in all the chauki compounds, but the trees in them are at present too small to permit of their being transplanted.

The existing line and avenue trees were trimmed, and dead and broken trees were replaced by new ones.

Wire was purchased for fencing, but only short lengths have been put up owing to the want of fencing posts.

As a whole, the plantations are very poor indeed, and some years must elapse before any return can be hoped for.

The unrestricted grazing which goes on everywhere destroys every plant immediately it comes up, and, until the whole canal is properly fenced, seed-sowing will only result in vexatious loss.

In one case where about half a mile of wire-fence was put up in order to prevent cattle being driven on to the canal, the fence has been completely destroyed in places, the wire being cut to pieces.

Financial results.—Receipts from beginning of operation to end of 1882-83 Rs. 5,083; charges Rs. 25,502.

8.—4TH DIVISION, SIRHIND CANAL.

Description of Works: Abohar Branch.—On the Abohar Branch nurseries of young trees were started in 9 chauki compounds. The nurseries at Tholia, Chenuwál, Smalsar and Dhafsie which have been watered from wells have prospered, but all below where water had to be carried from a long distance have failed entirely, none of the seed having germinated.

A large quantity of shísham seed was sown in the newly thrown up spoil in the last 10 miles of the canal, but none has germinated up to date. It is possible that it may do so during the coming rains if the seed has not been damaged in the ground.

Sutlej Navigation Channel.—On the Sutlej navigation channel a large number of young trees were transplanted on to the ramps of several of the road bridges; a considerable number are doing well, though the closure of the canal during April and May has been much against them. A number of mango trees were also transplanted into each of the chauki compounds.

During January and February shísham and siris seed was sown over a very large area, but none has yet germinated.

A mango tope with seedling mangoes from the Lahore Agri-Horticultural gardens has been formed in the 10th mile; a few of the trees have dried up, but a large number are doing well.

All the trees on the Branch were pruned in the cold weather, and a good deal of thinning was done.

Financial results.—Net revenue from plantation Rs. 14; expenditure up to end of 1882-83 Rs. 2,348-9-1.

9.—5TH DIVISION, SIRHIND CANAL.

General Remarks.—Owing to the opening of canal, plantations in this Division were renewed during 1882-83. Sanction was obtained too late to enable seed to be sown during the monsoon season, as no seed had been collected, but on certain portions of canal fair progress has been made in systematically planting the canal banks.

Description of Works.—The chauki compounds at Bhurtla and Dhamote have been planted with fruit and timber trees, and a plantation one acre in extent of mango and orange

trees received from Saháranpur has been planted out on canal banks. 422·8 acres of kíkar and phulái have been sown during the year on canal banks.

Establishment and Supervision.—Nil.

Financial results.—There were no receipts during the year; expenditure during 1882-83 Rs. 1,431-2-5.

The total capital expenditure to end of 1882-83 has been Rs. 6,061.

10.—WESTERN JUMNA CANAL.

The arboriculture reports of the Executive Engineers on the Western Jumna Canal are on the whole favorable, the financial results being a net profit on the year's expenses of Rs. 13,270, or nearly 300 per cent. The profit against capital expenditure and interest on total outlay cannot yet be determined, as the records in the Examiner's Office can only show the expenditure on capital account from the year 1877-78. Endeavours are being made to ascertain what the capital expenditure has been, from the old records in the office of the Superintending Engineer.

As no water has been admitted into the new Delhi Branch, expenditure on arboriculture has not been incurred during the year, as it was found to be quite useless to incur any. The details of the year's operations on the other Divisions are given in the reports by the Executive Engineers, appended.

The ravages of monkeys on all young plantations continue to be the subject of complaint from the Executive Engineers of the Hánsi and Delhi Divisions; it is very difficult to obviate this nuisance without a large establishment, and the cost of this would make it almost prohibitive.

Arboriculture operations during 1882-83.

Division	Area in acres under plantations up to end of 1882-83	During 1882-83			Capital expenditure from 1877-78	Remarks
		Expenditure	Income	Profit		
		Rs.	Rs.	Rs.	Rs.	
Karnál Division including New Main Line ...	3,231	776	786	10	3,414	Area includes land reclaimed from bends in old canal, 1,424 acres.
Hánsi „ „ New Hánsi Branch	1,373	2,445	9,848	7,403	132	
Delhi „ „ New Delhi Branch...	1,491	1,260	7,117	5,857	1,374	
Total ...	6,095	4,481	17,751	13,270	4,920	

Note.—The capital expenditure previous to the year 1877-78 is not traceable in the office of Examiner, Public Works Accounts, Punjab; but an endeavour is being made to ascertain the amount from the old records of Western Jumna Canal in the office of the Superintending Engineer at Delhi.

11.—KARNAL DIVISION, WESTERN JUMNA CANAL.

General Remarks.—The rainfall in the upper part of the Division (Umballa District) was above the average, being 45·42 inches against an average of 38·677 inches; in the lower part (Karnál District) it was 18·80 inches, or 7·95 inches below the average (26·75 inches). In other respects the year under review was uneventful as regards arboriculture.

Description of Work.—The gaps in the Dádúpur-Kharwán road and circular road were filled up. A total of 742 trees were planted during the year, of which 711 survive.

The table subjoined gives the number and species planted out :—

Species	Country name	Planted out in July	In August	In September	Total planted out	Dead at end of March	Gain to avenues for year
Artocarpus integrifolia ...	Kathal	5	4	...	9	2	7
Sizygium Jambolanum ...	Jáman	2	1	1	4	...	4
Mangifera Indica ...	Am (Desi) ...	1	4	...	5	...	5
Bauhinia variegata ...	Kachnár	1	...	...	1	...	1
Dalbergia sissu ...	Shísham	94	294	180	568	21	547
Cedrela Toona ...	Tún	25	39	28	92	8	84
Morus ? ...	Túnt (Desi) ...	4	...	5	9	...	9
? ...	Kurba	18	19	7	44	...	44
Azadarachta Indica ...	Ním	...	2	2	4	...	4
Bombax heptaphyllum ...	Simbal	...	...	6	6	...	6
	TOTAL ...	150	363	229	742	31	711

The young trees were taken from the Dádúpur nursery; each was protected by a circle of bushes, and was occasionally watered.

In July the entrance road of the Abdullapur chauki was planted on each side with 39 young trees; total 78 trees planted out. They were—50 shíshams, 25 túns, 1 mango and 2 kurbas, brought from Dádúpur nursery. All are flourishing.

The Soin plantation has been extended; 6½ acres of fresh land have been sown broadcast with shísham, túns, kíkar and teak. The teak never germinated; the kíkar and shísham survive, the túns died after a short appearance above ground. The total area now planted out amounts to 100 acres. For the most part the young trees promise well, but they require great care, as the soil being sandy gets hot and dry.

Below the Dádúpur station 1½ acres of land have been ploughed up and sown with shísham, túns and teak. The shísham and túns sprouted, but the teak never. The túns died; the shísham is prospering.

In the Dádúpur station 70 mango grafts were made, 60 of which are doing well. Some siris trees have been cut down, and gaps have been planted with young trees.

Young plants of *Millingtonia hortensis* have been obtained from Saháranpur and put out on the avenues leading to the chaukís on the New Main Line, *viz.*, to the Rambha, Karnál, Jáni and Mának chaukís. Besides these avenue plants, shísham and túns have been put out to form clusters in the several compounds.

The young plantation on the right of the Dádúpur regulator was well thinned out.

Thinning of the New Main Line kíkar plantations was commenced.

Establishment and Supervision.—The plantation work is done by málís generally in constant employ, assisted by laborers engaged by the day according to the exigencies of the work in hand. There were two málís kept throughout 1882-83, at Rs. 6 each, and two beldárs at Rs. 5 each per mensem. The daily pay of a laborer is 2½ annas. The supervision is entirely that of the Engineering staff.

Financial results.—

Receipts.

Sales of wood	Rs.	504	
„ fruit	„	282	
			786

Charges.

Labor	Rs.	776	
Surplus ...	„	10	

There was very little money available for arboriculture operations during the year under report; consequently there is slow progress in extending plantations.

12.—HANSI DIVISION, WESTERN JUMNA CANAL.

General Remarks.—The state of this branch of the Western Jumna Canal during the past year was not favorable to increasing the number of trees, in consequence of the canal berms having been kept more or less flooded by the high supplies required by a largely increased area of irrigation.

This flooding not only precludes the possibility of renewing the bank plantations, but has caused a large proportion of old trees to perish. These can, of course, all be replaced when the berms become silted up, but in the meantime it would be a waste of money to attempt to renew these plantations.

The new Hánsi Branch cannot be taken in hand until water is turned in; meanwhile nurseries for the road-trees will be established.

The old complaints, which I suppose every Executive Engineer has made in succession, must be again placed on record, *viz.*, until the canal is fenced and the herds of monkeys reduced, the raising of trees here will be tedious and expensive.

The usual figured abstract is appended.

Description of Work: Munak to Safidon.—The young kíkar plantations sown on the new spoil have thriven very irregularly, about one-half the sowing have failed, and will be resown; the remaining patches are doing well, and have been thinned and pruned. Six nurseries have been formed.

Road trees are not yet planted, pending water being turned into the canal.

Butána Canal.—At Bahádurpur the nursery has been attended to, and next year these trees will be fit for transplanting.

Below Gangáná, on the right fork, the road had become denuded of trees (if they ever existed); this has been planted, 780 young trees being set out, and protected by hurdles. Four nurseries are established and are thriving.

Below Gangáná, on the left fork, nothing has been done beyond filling in gaps; on the road 300 trees were planted. A large quantity of fuel was disposed of for brick-kilns.

Butána Chauki Compound.—The mango plantation is not thriving; the trees, which are of an excellent variety, seem to thrive until ten to fifteen years of age, and then die down from the top. Suspecting kankar at the roots, pits were sunk three years ago, but to all appearance the soil is good to ten feet in depth, and other trees flourish luxuriantly in the garden. The mango crop was a failure, yielding only Rs. 9-14 at auction, against

1881-82	...	...	...	Rs. 180
1880-81	...	...	...	„ 45
1879-80	...	...	...	„ 392

Some new sorts will be planted this year, the plants being obtained from Saháranpur.

Safidon to Mawáná.—On the new road from Safidon lock to the Bádsháhi bridge 300 trees were planted, and between Safidon bridge No. 2 and Mawáná about 300 trees were planted, alongside road on right bank; and several nurseries have been made.

Mawáná to Jínd.—The raising of the canal road has necessitated the cutting of a large number of trees, which have supplied the brick-kilns with fuel. No new planting-out was done here. Some few nurseries were established below Dhaliat.

Jínd to Rámrai.—The reason given above, *viz.*, the work of raising both canal-banks, has prevented any planting-out, and no nurseries that were made were successful, chiefly from bad arrangement.

Rámrai to Hánsi.—375 trees were planted, but no fence that has yet been devised seems proof against the numerous cattle driven here; fully 25 per cent. have perished.

The reason of this failure seems to have been—(1) the plants were much too small for transplanting; (2) no efficient plan of regular watering was arranged; (3) more money must be spent on the fencing.

Wherever the plan of watering by buried gharra was adopted the plants survived, except where eaten by cattle.

The Assistant Engineer complains of there being no nurseries from which suitable plants could be taken; this is true, and is now being remedied.

13.—DELHI DIVISION, WESTERN JUMNA CANAL.

General Remarks.—There was no event peculiar to the year under review which specially affected arboriculture, except the rainfall, which has been less in comparison with the average for six years.

This Division, which consists of Delhi, Hánsi and Rohtak canals, is well planted with trees of all descriptions, and is affording considerable supplies of timber and fuel. The statement attached shows the total length planted out and still available for plantation, together with the species of trees planted during the year in the several localities of this Division.

Description of Work.—On the Rohtak canal, for about 11 miles on the right bank, plantation has been carried out for the last two years. About 76 trees planted this year and about 723 in former years have been looked after. These trees generally consisted of shísham, túm, jáman, ním, siris and túl, and have not thriven well, as rain did not fall at a seasonable time.

The banks of Hánsi canal, 10 miles in length in this Division, are not fit for planting trees.

An attempt was made to grow kíkar along the Delhi canal in places where gaps occur. The result was not successful, due probably to the dryness of the season, and to the fact that if the soil had been suitable the trees would have grown spontaneously.

The following plantations were kept up during the year:—

Gangatoli	chauki.
Saragthal	„
Israna	„
Khukrána	„
Lohári	„

At Gangatoli the chief work was the experimental sowing of the *Reana luxurians*, of which a separate report has been submitted. The young trees sown in 1881 were watered and taken care of during the year. These have now attained a good size, and will be transplanted to the banks of new Rajbáhas during the coming rains.

At Saragthal the main work consisted in carrying on the plantations along the roadway of No. XII Rajbáha. The dead trees along the roadway were also replaced.

No. IX, Rajbáha, 15 miles in length.—A nursery is maintained for this Rajbáha in Israna chauki from which young trees are transplanted on the banks for about 7 miles where wanted. About 219 trees have been transplanted this year, and 586 taken care of.

No. VIII Rajbáha.—The total length of this Rajbáha and its branches is 55 miles. Attempts have been made to plant trees there; for this purpose nurseries have been maintained at Khukrána and Lohári chaukís. Kíkar seed has been sown for the last two years on the right and left branches, and the young plants are doing well. About 614 trees have been planted this year in chauki compounds, and for about 15 chains on the Main line and 4 chains on the right branch; and 1,049 planted last year taken care of. There are the following mango gardens in the Division which yield a fair profit to Government every year:—

Saragthal.	Nolttea.
Gangatoli.	Israna.
Chota Thána.	Rohtak.
Sardhana.	

The young mangoes sown in 1881 were looked after, and will probably be ready for grafting next year. The earth round each tree was dug up and manured and watered as often as necessary. The dry wood was carefully cut away from the trees. The young fruit was blown down by high winds, and the trees bore fewer fruit during the year than the year before, and consequently the amount realized by the sale of the produce was less.

The trees seem only to bear well every second year, which can only be accounted for by the wetness of the sub-soil, due to the proximity of the canal. The leaves of the trees do not dry and drop off as they should in the cold weather, showing that the sap has not descended to the roots. At Saragthal the young mango trees are very flourishing, and, as these were not sufficient to fill up the ground, about 210 young plants were grafted during the year.

The trees along the Rohtak and Delhi canals were thoroughly pruned. All the dry timber was cut away and sold as fuel, and young shoots on the trunks cut off.

Establishment and Supervision.—Except málís at nurseries, no special establishment was entertained for this Division, the charges shown being for daily labor, kúlís, &c.,

employed from time to time as required. The supervision was made by the sub-overseer, sub-divisional officers and the Executive Engineer throughout the year.

Financial results.—The receipts during the year under the head "plantation" have been as below:—

		Rs.	A.	P.
Sale of timber	... ...	1,544	7	1
„ fuel	... ...	4,807	11	3
„ fruit	... ...	401	5	0
„ grass, &c.	... ...	363	7	8
Total	...	7,116	15	0
Sundry charges of maintaining plantation		1,260	0	0
Surplus or profit	...	5,856	15	0

14.—MUZAFFARGARH DIVISION, INUNDATION CANALS.

General Remarks.—The operations during the year have been entirely the maintenance of existing plantations at Kot Ratta embankment, and the Waliwah Branch of the Ganesh canal.

The principal reasons for decrease in the receipts on account of the sale of canal produce for this year, as compared with last, are as follows:—

Last year the proceeds of the sale of lúng and sarkana were credited to the Canal, but this year they have not been so, by order of Deputy Commissioner; while last year the value of wood sold was much increased on account of woods cut down on the Pír Branch of the Waliwah.

Description of Work.—Málís and bhistís were employed to water the young trees and protect the old ones in the plantations and chauki compounds of Paháripur and Kirari.

Establishment and Supervision.—Nine málís at Rs. 6 for 12 months were sanctioned; and the supervision is carried out by the Executive Engineer and subordinates.

Financial results.—

Receipts.

Sale of wood	...	Rs.	705	9	1
„ lúng and sarkana	...	„	1,287	0	8
„ fruit	...	„	60	0	0
Total	...	„	2,052	9	9

Charges.

Watering trees, &c.	...	Rs.	556	12	10

PROGRESS REPORT

OF

DISTRICT, CANAL & PROVINCIAL ROADS ARBORICULTURE

IN THE PUNJAB

For 1883-84.

Compiled by the Conservator of Forests.

WITH A REVIEW BY HIS HONOR THE LIEUTENANT-GOVERNOR OF THE PUNJAB

LAHORE: PRINTED BY W. BALL & Co.,
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Proceedings of the Hon'ble the Lieutenant-Governor in the Forest Department No. 615 S., dated 7th October 1884.

READ—

Report by MR. B. RIBBENTROP, Conservator of Forests, Punjab, on the progress of Arboriculture in the Punjab during the year 1883-84.

REMARKS.—The Report was again received late, owing to the fact that the returns for the 1st and 2nd Divisions of the Bari Doab Canal were not submitted to the Conservator by the prescribed date, and this want of punctuality has further rendered the present Report incomplete. The Lieutenant-Governor is unable to understand why a communication of so simple a nature as an Arboricultural Report cannot be prepared and forwarded by the appointed time, and the Joint Secretary to Government in the Department Public Works, Irrigation Branch, will be requested to explain the reasons why the statements for the Bari Doab Canal were delayed on the present occasion.

2. The year was marked by a deficient rainfall, which resulted in the death of many young plants, and in the famine and disease of numbers of established trees whose roots had not reached the level of perpetual moisture. The consequence has been that in the arid, very dry, and dry districts of the Province the energies of district officials have been devoted principally to preserving existing trees and to supplying the gaps made by the unfavourable season, and planting operations have therefore been somewhat limited. Another consequence of the scanty rainfall has been the increase of expenditure on the establishment maintained for watering trees; but when the adverse nature of the year is considered, it may fairly be said that on the whole the Report does not reveal an unsatisfactory state of things.

3. The following table shows the expenditure, receipts, and net cost of arboriculture during the last four years :—

	Expenditure.	*Receipts.*	*Net Expenditure.*
	Rs.	Rs.	Rs.
1880-81	... 105,695	29,875	75,721
1881-82	... 107,886	35,478	72,408
1882-83	... 99,581	32,864	66,717
1883-84	... 139,804	50,944	88,860

From this it will be seen that the receipts have grown considerably; and although, as has been remarked before, an increase of income does not necessarily argue good management, the greater notice and attention which is evidently being paid to the lopping and clearing of trees would appear to warrant the assumption that the large income derived this year from avenues and groves has not been obtained at the expense of the future welfare of arboriculture. The steady increase in the receipts during the last four years seems to justify the conclusion in the Review of 1882-83 that, with constant activity in planting, and with care and discretion in lopping and thinning, arboriculture in the Punjab may become not only self-supporting, but also a source of considerable income to Local Bodies and to Government.

4. The Province has been divided, for the purposes of the Report, into four divisions :—

(1) Arid districts;
(2) Very dry districts;
(3) Dry districts;
(4) Forest districts.

As might have been expected, the first division has suffered most severely from the scanty rainfall during 1883-84, and retrogression in arboriculture has been prevented only with great difficulty. The Lieutenant-Governor concurs with the Conservator of Forests in thinking that in the arid districts arboriculture should be started from easily-established centres, and that costly attempts to plant avenues across a sandy desert like the Thal in Muzaffargarh are, generally speaking, to be

deprecated. During the year sanction was accorded to the purchase of 423 acres of land in the Sirsa District for the formation of a plantation. The Lieutenant-Governor would be glad to see District Committees take up the question of acquiring lands on favourable sites, either by purchase, or, as in the case of the Delhi District, by agreement with the villagers. In the latter direction much might be done by Local Bodies in the more backward parts of the Province, and His Honor hopes that other districts will follow the example of Delhi and Gurgaon in this respect.

The account of the proposed afforestation of the Sukesar Hill in the Shahpur District is interesting, but it appears doubtful if a large expenditure should be incurred on this object from District Funds. The work will not, it is understood, be of any benefit to the district at large, or to the villages situated in the neighbourhood of the hill, and the cost of it would perhaps fall more properly on Provincial Revenues. Sir Charles Aitchison would wish the Commissioner of the Rawalpindi Division to submit a brief report on this point, and to favour him with his opinion whether the utility of the work is such as to justify a small grant from Government for its prosecution.

5. In the very dry districts all that could be done as a rule was to preserve nurseries and gardens from ruin; but in Ferozepore planting was carried on with a very large percentage of success in spite of the short rainfall. A system obtains in this district by which the men in charge of avenues are fined for every tree that dies after one year from the time of planting. This plan is recommended by the Conservator to the attention of District Officers, and it may doubtless be a good one under special circumstances; but the better system of rewards has been found to succeed in other parts of the Province, and it would seem preferable to encourage arboriculture by the grant of small khillats and certificates to persons who have interested themselves in the subject, as has been done in Kulu by the Assistant Commissioner, and as it is now proposed to do in various other districts. The Deputy Commissioner of Ludhiana is of opinion that legal responsibility should be imposed on the people in the matter of arboriculture; but it appears to the Lieutenant-Governor that all schemes of this kind must depend mainly for their success on the steady persistence of District Officers who are in a position to gradually popularize the work, and to carry the people of the country with them in it, and that the only action which Government can properly take in the great majority of cases is to set a good example to the zamindars and encourage them to maintain their efforts to grow trees. In Peshawar the mulberry tree is popular for roadside avenues, and it thrives there admirably; but the Conservator agrees with Colonel Waterfield in considering that it is open to objection on the ground that it harbours insects and is liable to be hacked about for fruit and fodder. The latter objection can presumably be remedied, and as the mulberry yields an important supply of food to the poorer classes, it appears doubtful whether its further growth in the Peshawar District should be deliberately discouraged. The Report of the Karnal District is exceedingly meagre, and the results recorded appear hardly commensurate with the large expenditure incurred on establishment for watering. In Rohtak the vigilant supervision exercised over the watering establishment secured a fair amount of success for the trees planted out. The Conservator notices that the charges for watering were high, but it is desirable that every effort should be made to keep trees alive during seasons of drought, and that expenditure should be concentrated on this in years such as 1883-84.

6. The value of trees for purposes of fodder throughout the Hissar and Delhi Divisions is very great, and this is an additional reason why every possible measure should be adopted to encourage the development of arboriculture in these parts of the Province. In the dry districts a certain amount of progress has been made. In Delhi a plan has been adopted which promises well. The District Committee have arranged to take over plots of land from the zamindars and to plant, fence, and guard the area entrusted to them. The property of the soil will remain with the landholders, but the Committee will receive half the value of the timber grown upon it. Experimental arrangements are also being made for the reboisement of the Delhi ridge. This will be a somewhat costly undertaking, and will probably require to be persisted in for many years; but if success is attained, it will doubtless prove of great benefit to the city of Delhi, and will show what can be done in

the way of arboriculture. In the Lahore Report it is satisfactory to notice that a systematic plan for future operations with regard to the extension of avenues and groves is under preparation. The plan will show all the roads and parts of roads on which trees have been planted, the lengths on which, owing to the nature of the soil and scarcity of water, it is hopeless to raise shade-giving trees, and the localities where groves for the convenience of travellers have been and can be usefully planted. The necessity of an arboricultural working plan has been insisted on in previous Reviews, but the Lieutenant-Governor notices with regret that his instructions on this subject have apparently been overlooked in many cases. The time has now arrived when arboriculture should be treated in a comprehensive and systematic manner, and His Honor hopes that a district scheme will be drawn up in every case during the next cold weather. The attention of the Commissioners of Divisions is particularly invited to this point, and it is requested that it may be noticed in all district reports in future. As remarked by the Conservator, without a fixed plan too much is left to the idiosyncracies not only of District Officers but also of the subordinate Revenue Officials, and expenditure and operations are thus often apt to fail of their object when success might be obtained by a little more persistence in accordance with a preconceived scheme. Now that the Forest Officers will be more nearly associated with the District Staff, and will be able to advise and assist in arboricultural operations, it is all the more necessary that a working plan should be drawn up for each district, and orders should at once be issued by the Commissioners of Divisions for its due preparation.

7. The Forest districts of the Province naturally suffered less than the others from the effect of the drought during the past year. The Deputy Commissioner of Sialkot has proposed that in his district all efforts should be concentrated on maintaining existing avenues and groves, and attempts should not be made to extend arboriculture at present. This conclusion, as remarked by the Conservator, appears to be somewhat premature, and the Lieutenant-Governor hopes that it will not be adopted. The Report of the Gurdaspur District is very interesting and shows that a systematic treatment of arboriculture has been introduced. Colonel Harcourt's observations on the leaf-shedding of trees will doubtless prove of interest and use hereafter, and his remarks on the subject of lopping are instructive. The scheme for the development of arboriculture adopted in Gurdaspur has resulted in an increased efficiency and a reduction in expenditure. In Gujrat more might perhaps have been done, and the progress in Hoshiarpur can hardly be termed satisfactory, as far as it is possible to judge from the report submitted by the Deputy Commissioner. In districts like these greater extensions in arboriculture may fairly be looked for than in less favoured tracts, and His Honor trusts that the Reports for next year will show that the time lost in 1883-84 has been fully made up. It is to be regretted that many trees should have died in Umballa which might have been saved as in other districts by a temporary increase in the staff of bhisties, and the Lieutenant-Governor agrees with Mr. Ribbentrop in thinking that a somewhat increased expenditure would have been true economy in this instance. No report is at present submitted from the Simla District. It will be convenient, however, as pointed out by the Commissioner of Umballa, that the Report on the Simla Municipal orchards, towards which contributions have been made by the Local and Imperial Governments, should be submitted in future for publication with the Annual Report on Arboriculture, and it is requested that this may be done accordingly.

8. In part (*c*) of his Report the Conservator pays a tribute to the usefulness of Government gardens. Hitherto the distinction between these and groves and nurseries has not been very clearly defined. Mr. Ribbentrop proposes that this should be done in future, and the proposal will be noticed further on. One of the most important subjects in connection with arboriculture is the management of nurseries, and the Conservator is of opinion that sufficient attention is seldom paid to this part of the work. The notices of nurseries contained in the district reports are very meagre, and as the success of planting operations depends very largely on the maintenance of these in a healthy and well-stocked condition, the Lieutenant-Governor is disposed to agree that a more detailed account of them should be required in future. In view of the difficulty

of effectually fencing young trees against destruction by grazing, the remarks of the Conservator regarding the advantages of planting out saplings with high stems should be borne in mind. As remarked by Mr. Ribbentrop, there is little use in putting out young plants for the sole purpose of providing fodder for goats and sheep ; and where owing to special reasons unusual difficulties present themselves in this respect, it is far better and much cheaper in the long run to gradually plant out and secure a small number of well-developed young trees than to repeatedly attempt to grow a large number of half-grown saplings and see every attempt end in failure. It is satisfactory to learn that the supervision of the lopping of roadside trees is now generally intrusted to men specially trained in the work of pruning and thinning of timber, and that pains are taken to supervise their operations. Without such supervision the trees are inevitably mutilated and are sometimes even destroyed, the sole idea of the woodcutter being to cut down as much as he can ; and it may be hoped that the very extensive thinnings which took place in the Hoshiarpur District were efficiently controlled. It is not understood why the villagers should be allowed to lop the trees on the Lower Sutlej Canals in a merciless manner, and enquiry will be made as to whether it is not possible to curtail the abuse of their privilege in this respect.

9. The year under report has not been favourable for the development of arboriculture by private persons, but the Lieutenant-Governor is glad to observe indications in the present Report that in some districts a more lively interest is now being taken by the people in this subject. Much may, no doubt, be done by the direct agency of Government to plant and maintain avenues ; but until the people themselves commence tree cultivation, the objects of Government cannot be completely attained. Any system of arboriculture by which the sympathies and self-interest of the community can be aroused should be furthered in every legitimate manner, and schemes such as that which has been started in Delhi and Gurgaon should be encouraged in all possible ways, and should if feasible be adopted in other districts. The enforcement of the provision in the Shahpur Settlement, by which the cultivators are required to plant trees on two marlas of land around each well, will, no doubt, be attended with useful results ; but it will be necessary for the Deputy Commissioner to see that this provision is not carried out in such a manner as will entail hardship. The practice of giving fruit-trees gratis to persons who apply for them, which is noticed in Gurdaspur and Ludhiana, might be followed with advantage throughout the Province generally, and in this connection again the importance of maintaining sufficient nurseries cannot be exaggerated. No inducement by which the people may be brought to plant trees should be considered too trivial, and Sir Charles Aitchison hopes that all ranks of officers and all local bodies will devote their special attention to this subject during the next few years.

The question of fuel and fodder reserves, which is intimately associated with the subject of arboriculture, is being considered separately, and separate orders will presently be issued in connection with it. But the same observation on the necessity of enlisting the sympathies of the people apply equally to the one as to the other, and His Honor trusts that when encouraging zamindars to plant groves of trees, District Officers will take the opportunity of impressing on village communities how essential it is to their welfare to reserve part of their grazing lands for fuel and fodder purposes. It may be added that it is proposed to insert provisions with this object in the new Land Revenue Act of the Punjab, which is now under consideration.

10. In paragraph 3 of the Review of last year the Conservator was requested to take steps to embody in a single paper the various suggestions which have been made from time to time in connection with arboriculture, and the various orders issued by Government in the Reviews of Annual Reports and elsewhere. Mr. Ribbentrop has not referred to this in the present Report, and it does not appear whether any action has been taken in accordance with the wishes of the Lieutenant-Governor or not. Sir Charles Aitchison desires that the above instructions may now be carried out without further delay, and that the draft which the

Conservator would propose to issue may, in consultation with the Financial Commissioner, be circulated for remarks to selected officers who have taken a special interest in arboriculture in the past. When their opinions have been received it will perhaps be found convenient to assemble a small Committee at Lahore towards the end of the cold weather to discuss the whole question; and if the Financial Commissioner and Conservator of Forests think this desirable, the Lieutenant-Governor will be glad to acceed to their recommendation. If such a Committee should assemble it will be desirable that the members should take into consideration the form of the Arboricultural Report. The Lieutenant-Governor, as already stated, agrees with the Conservator of Forests that a more strict definition of gardens, groves and nurseries should be adopted, and that these should be treated separately in the District Reports. His Honor also thinks that further details of the expenditure on arboriculture are desirable, though he doubts whether those proposed by Mr. Ribbentrop are not somewhat unnecessarily elaborate. The Committee might further consider the suggestion made by the Superintending Engineer of the Western Jumna Canal, that the returns furnished by the Irrigation Department should be made to correspond with those already prepared from an actual enumeration of the trees under departmental orders. It should be noted that the Lieutenant-Governor intends to recommend to the Government of India that the Arboricultural Report be made triennial instead of annual, and that statements only should be submitted for the years when no Report is required. This, if approved, will doubtless affect the recommendations of the Committee as to the form of the Report. A further communication on this point will be made to the Conservator of Forests before the Committee meets.

11. In conclusion, the Lieutenant-Governor desires to acknowledge the general interest which is taken in arboriculture by District Officers and Local Bodies, and in particular the efforts of Colonel Grey, Mr. Coldstream, the Deputy Commissioners of the Delhi, Gurgaon, Sirsa, Rohtak, Ludhiana, Jullundur, Gurdaspur, Lahore, Ferozepore, Rawalpindi, Dera Ghazi Khan and Muzaffargarh districts, and Mr. L. Dane the Assistant Commissioner of Kulu.

ORDER.—Ordered that the above remarks be printed and circulated with the Report as usual.

Also that they be published in the *Punjab Government Gazette.*

Also that they be forwarded to the Government of India in the Department of Revenue and Agriculture with the usual number of copies of the Report.

Also that a copy be forwarded to the Joint Secretary to Government, Public Works Department, Irrigation Branch, with reference to the remarks contained in paragraphs 1 and 8.

Also that a copy be forwarded to the Financial Commissioner of the Punjab with reference to the suggestions contained in paragraph 10.

By order of His Honor the Lieutenant-Governor,

H. C. FANSHAWE,

Offg. Junior Secretary to Government, Punjab.

Punjab Government Secretariat Branch Press, Simla.—8-10-84—400.

C. L. No. 6, dated 20th August 1884.

From—BERTH RIBBENTROP, Esq., Conservator of Forests, Punjab,

To—The Junior Secretary to Government, Punjab.

SIR,

I have the honor to submit the progress report on District and Canal Arboriculture for the year 1883-84. The report is due to Government by the 1st of September, and the district reports were received by me sufficiently early to permit me to compile the report in time, but I have till now waited for the report of the Bari Doab Canal, 1st and 2nd Divisions. They have not come to hand however, and I cannot further delay the submission of the rest on their account.

A.—GENERAL REMARKS REGARDING THE SEASON OF 1883-84.

1. The rainfall throughout the Province was far below the average, and unfavourably distributed for arboriculture. I have already noted this in my Annual Report on Forest administration, and can only repeat that the long break in the rains from the beginning of July to end of September spread over nearly the whole of the Province and was fatal to the hopes of successful arboriculture (*at least* without intense artificial irrigation in the drier districts).

2. In the Kangra district we observe the greatest deficiency in rainfall, 40·3 inches being noted in Kangra against an average of 79·9 and 32·3 inches in Nurpur against an average of 81·2. In the Hoshiarpur, Gurdaspur, Sialkot, Jhelam and Rawalpindi districts, the short rainfall is very considerable, nearing, however, the average towards the western part of the Province.

Large, however, as the differences are in these districts underlying the Himalayas, this shortcoming should not be felt so intensely and be more easily met than in the very dry and arid districts, where an inch of rain more or less is of vital importance and a break at an inopportune time means death to a young tree, and famine and disease even to established trees whose roots have not reached the depth of perpetual moisture.

I intended to prepare a map comparing the year's rainfall with the average, but hesitated when I found Montgomery entered in the Report with a rainfall of 37·3 inches and Ferozepur with 63·8. I thought at first that the historical bhisties had been at work, but found as regards Montgomery that the total of the rainfall of the four tahsils was given as the rainfall of the district, but I was not so fortunate as to satisfy my doubts in some other instances.

The following is a table of Rainfall as reported.

District.	Tahsil.	Average.	During the year.	Remarks.
I.—ARID.				
Sirsa	...	16·37	15·3	
Shahpur	...	...	14·4	
Mooltan	Mooltan	...	6·2	Shujabad 5·1, Lodhran 2·6, Mailsi 4·4, and Sarai Sidhu 4·3.
Jhang	Jhang	7·5	5·3	
	Chiniot	...	9·0	
	Shorkot	...	8·2	
Montgomery	...	11·4	9·3	I have taken the mean of the four Thanahs.
Muzaffargarh	Muzaffargarh	4·3	...	
	Alipur	2·3	...	
	Sanawan	2·8	...	

District.	Tahsil.	Average.	During the year.	Remarks.
Dera Ismail Khan	Dera Ismail Khan	8·0	7·90	
	Tank	8·65	2·80	
	Leiah	6·7	8·30	
	Bhakkar	9·19	9·80	
Dera Ghazi Khan	...	5·8	1·97	
Bannu	...	12·5	10·2	
II.—Very Dry.				
Hissar	Hissar	16·1	9·9	
	Hansi	16·5	14·7	
...	Bhiwani	17·2	13·2	
...	Fatehabad	16·0	13·1	
	Barwala	17·8	15·1	
Kohat	...	15·8	18·0	
Peshawar	Peshawar		13·8	
	Mardan		28·3	
	Utman Bolak	14·6	3·9	
	Hashtnagar		13·4	
	Daudzai		13·5	
Ferozepur	...	5·7½	63·8	Cannot explain this.
Karnal	Karnal	22·2	17·5	
	Panipat	22·7	14·7	
	Kaithal	17·5	7·1	
Rohtak	...	19·3	12·8	
III.—Dry.				
Lahore	Lahore	...	19·6	
	Kasur	...	14·2	
	Chunian	...	25·6	
	Sharakpur	...	20·0	
Ludhiana	...	27·2	29·8	
Jullundur	...	31·0	13·0	I should say this figure was problematical.
Amritsar	...	30·8	32·7	
Gujranwala	Gujrauwala	21·5	26·3	
	Wazirabad	21·1	17·3	
	Hafizabad	18·4	17·3	
Delhi	Sonipat	22·0	14·3	
	Ballabgarh	24·8	20·1	
	Delhi	26·5	14·3	
Gurgaon	Gurgaon	21·3	16·8	
	Nuh	23·1	14·4	
	Palwal	23·9	8·2	
	Ferozpur	21·25	21·7	
	Rewari	22·04	10·5	
Jhelam	Jhelam	31·4	22·9	
	Pind Dadan Khan	17·2	17·6	
	Chakwal	23·0	14·8	
	Tallagang	21·7	17·3	
IV.—Forest Districts.				
Sialkot	Sialkot	37·68	31·1	
	Pasrur	35·36	23·7	
	Riah	23·41	17·2	
Gurdaspur	Shakargarh	32·62	26·3	
	Batala	23·0	26·7	
	Pathankot	42·66	35·0	
	Gurdaspur	25·3	19·1	
Gujrat	...	30·47	26·0	
Hoshiarpur	Hoshiarpur	35·87	18·5	
	Dasuah	37·13	18·0	
	Garhshankar	33·26	20·6	
	Una	33·14	15·9	
Rawalpindi	Rawalpindi	33·15	29·5	
	Fattehjang	...	24·4	
	Pindigheb	16·20	15·4	
	Attock	...	22·0	
	Gujar Khan	...	34·1	
	Kahuta	...	48·7	
Hazara	...	...	...	
Umballa	...	...	14·7	
Kangra	Nurpur	81·2	32·3	
	Kangra	79·9	40·3	

B.—DISTRICT ARBORICULTURE BY DIRECT GOVERNMENT AGENCY.

(*a*).—General.

3. The following statements are abstracts of the work done in each district. I do not think that the information is as yet thoroughly reliable in every instance, but a vast improvement has taken place, and the closing balance no doubt represents approachingly the present extent of arboricultural operations. The first table shows the progress in the planting of avenues.

It will be seen that the length of the district roads in the province is said to amount to 47,300,000 of feet, and that at the end of the year 25,800,000 feet of single line of established avenue planting existed. Taking it for granted that every avenue consists of two lines only, which is not always the case, but sufficiently near for a generalization, 12,900,000 feet of road side have an established avenue leaving a balance of unplanted district roads of 34,400,000.

A very large proportion of these roads can never be provided with avenues, save at a cost perfectly disproportionate to the advantages derived therefrom. The year's work amounted to 4,034,000 feet and the failures or deaths in existing avenues to 1,414,000, presenting an increase in the length of established avenues of 2,620,000 feet.

A great part of this increase, as will be seen from the paras treating of the detail of the work district by district, or from a perusal of the district reports, consists in filling up blanks, and the new work represents in several instances only the replanting of avenues which had failed entirely or had been destroyed by grazing or other causes.

Progress Statement of avenues planted in the District during the year 1883-84.

	I	II	III	IV	V	VI	VII
DISTRICT.	Road or canal on which avenues have been planted or are in course of construction.	Length of single lines stocked with trees or established plants at the beginning of the year.	Length of single lines planted during the year.	Length of single lines on which cultivation has failed or on which trees or established plants have been destroyed or felled.	Length of single lines stocked with trees or established plants at the end of the year.	Species of trees cultivated.	REMARKS.
	Total length in feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*		
I.—ARID.							
Sirsa	1,129,920	406,440	1,540	4,290	403,690	Shisham, nim, kikar, and pipal.	
Shahpur	1,791,622	1,501,222	110,655	24,953	1,586,924	Kikar, ber, siris, tut, shisham, pipal, mangoes, bakain, jaman, farash.	
Mooltan	1,791,002	207,710	55,008	15,190	247,528	Siris, shisham, pipal, bor, kikar, ukan bakain, ber, mangoe, jaman.	
Jhang	1,396,560	222,380	36,500	3,680	255,200	Shisham, siris, ber, kikar, tut, pipal, banyan, tamarisk, date, amaltas, phulai, jand, jaman, and barna.	
Montgomery ...	480,500	73,920	5,280	...	79,200	Sharin, tut, kikar, ber and shisham.	
Muzaffargarh ...	2,155,560	244,860	31,680	...	276,540	Shisham, farash, mulberry.	
Dera Ismail Khan ...	977,760	253,440	90,460	18,180	325,720	Shisham, tamarisk, sarin, ber, bhani.	
Dera Ghazi Khan ...	1,642,080	401,280	36,960	15,840	422,400	Shisham, kikar, siris, mangoe, nim, eucalyptus, jaman, toon, mulberry, carob, mesquit, pomegranate, &c.	
Bannu	641,091	344,977	80,928	27,168	398,737	Kikar, ber, shisham, mulbery, willow, khagal.	
II.—VERY DRY.							
Hissar	557,240	142,560	...	...	142,560	Kikar, shisham, pipal, mulberry.	Does not show avenue at Hansi mentioned in report.
Kohat	6,720	3,000	2,240	1,040	4,200	Shisham, sarin, mulberry, eucalyptus, ber, and tut.	
Peshawar	1,047,160	385,020	271,600	77,275	579,345	Shisham, mulberry, pipal, ber, willow, ghaz, dhrek, siri and phula.	
Ferozepore	3,187,800	2,065,800	29,040	...	2,094,840	Kikar, farash, beri, tut, and tali.	

District.	I Road or canal on which avenues have been planted or are in course of construction. *Total length in feet.*	II Length of single lines stocked with trees or established plants at the beginning of the year. *Feet.*	III Length of single lines planted during the year. *Feet.*	IV Length of single lines on which cultivation has failed or on which trees or established plants have been destroyed or felled. *Feet.*	V Length of single lines stocked with trees or established plants at the end of the year. *Feet.*	VI Species of trees cultivated.	VII Remarks.
Karnal	1,245,982	320,140	19,140	34,200	305,080	Shisham, siris, nim, tut, jaman, and pipal.	
Rohtak	1,608,560	484,000	65,160	16,090	533,070	Shisham, nim, farsh, kikar, tun, siris, katchnal, mangoe.	
III.—Dry.							
Lahore	1,459,920	380,160	17,230	26,400	370,990	Shisham, kikar, rehru, tut, farash, sharin, and jaman.	
Ludhiana	430,320	520,160	7,840	...	528,000	Shisham, jaman, siris, bar, pipal and mulberry.	
Jullundur	884,250	991,420	61,770	2,100	1,051,090	Shisham.	
Amritsar	1,026,075	579,340	78,005	58,520	598,825	Shisham, tut, jaman, siris, nim, bohar, pipal, mangoe.	
Gujranwalla	1,874,400	533,560	...	15,840	522,720	Shisham, kikar, phurwan, mulberry, siris.	
Delhi	1,122,960	500,344	391,535	349,935	541,944	Shisham, nim, siris, gullar, jaman, mulberry, kikar, mangoe, bakain, pipal, khatta.	
Gurgaon	1,409,780	1,030,900	56,060	7,000	1,079,960	Shisham, nim, siris, jaman, kikar, gular, pipal, farash.	
Jhelum	1,317,310	854,540	144,897	37,050	962,387	Shisham, kikar, mulberry, bakain.	
IV.-Forest Districts.							
Sialkot	1,341,120	876,480	55,440	30,360	901,560	Dalbergia, sissu, acacia spicasa, mulberry, acacia arabica, zizyphus, jujuba, acacia modesta, bahera, shisham, pipal.	
Gurdaspur	3,918,630	1,781,950	260,350	4,758	2,037,542	Shisham, mulberry, mangoe, jaman, kikar, siris, ber, drek, phulah, lasura, bar, pipal, simal, phaguri.	
Gujrat	362,000	287,500	11,500	8,500	290,500	Shisham.	
Hoshiarpur	2,336,460	1,882,440	...	...	1,882,440	Tun, mangoe, pilkhan, bahera, jaman, eucalyptus, patayan, pipal, bar, shisham arjun, gumbar, khirni, maulsari, hirak, dheo, jack &c.	
Rawalpindi	4,475,788	1,541,768	631,202	190,677	1,982,293	Shisham, mulberry, kikar, phulla, drek, ber, cao, bor, lasura, phagwara.	
Hazara	1,008,615	299,969	24,672	7,300	317,341	Shisham, mulberry, bakain, tamarix, siris, kikar, willow.	
Umballa	1,810,080	1,150,500	22,123	58,454	1,114,169	Shisham, nim, lasura, jaman, mulberry, tun.	
Kangra	2,864,677	2,908,648	1,435,246	379,653	3,964,241	Mulberry, tun, mangoe, shisham, karal, ber, simbal, drek, khirk, bamboo.	
Simla	...	...	...	...	...	...	
Total ...	47,301,942	23,181,428	4,034,061	1,414,453	25,801,036		

4. The subjoined is a statement of groves district by district, as far as I could abstract it from the information before me.

I am inclined to believe that this statement still contains some omissions, for as it stands the area of Government land available for the planting of small forests, groves and topes is given at 2,143 acres only, of which it is said that 1,649 acres were stocked at the end of the year.

This year's operations are reported as comprising 160 acres, of which 104 acres failed in consequence of the exceptionally unfavourable season.

Progress Statement of groves planted in Districts during the year 1883-84.

District.	I Area on which groves have been planted or are in course of construction. *Total area in acres.*	II Area stocked with trees or established plants at the beginning of the year. *Acres.*	III Area planted during the year. *Acres.*	IV Area on which cultivation has failed or on which trees have been destroyed or felled.	V Area stocked with trees or established plants at the end of the year.	VI Species of trees cultivated.	VII Remarks.
I.—Arid.							
Sirsa	163 0 0	...	...	...	...	Shisham, pipal, nim, siris, bakain, kikar, and pomegranate, eucalyptus and carob.	7,475 trees at the beginning of the year, 387 planted during the year, 716 died 7146 trees at the close of the year.
Shahpur	146 3 0	83 0 0	42 3 0	14 0 0	111 3 0	Shisham, kikar, firs, bamboo, tut, willow and poplars.	
Mooltan	...	...	...	...	...	Carob, Bombay shah pasand, sufeda mangoe, grevillea, robusta, eucalyptus, shisham, bor, pipal, jaman, alucha, and aru.	19,996 trees at the close of the year.
Jhang...	376 3 22	361 3 23	0 2 10	...	362 1 33	Mangoe, banyan, pipal, ber, shisham, willow, grape, fig, symbul, apple, eucalyptus, pomegranate, oranges, bed mushk, barna, alucha, peach tut, apricot, date, phulahi, kikar, jand, tamarisk, &c.	
Montgomery... ...	22 1 20	22 1 20	...	...	22 1 20	Not given.	
Muzaffargarh ...	129 3 12	108 1 39	17 1 13	90 1 26	35 1 26	Shisham.	
Dera Ismail Khan ...	...	11 0 0	...	...	11 0 0	None planted.	
Dera Ghazi Khan ...	121 2 0	71 0 0	50 2 0	...	121 2 0	Shisham, siris, eucalyptus, mangoe, nim, tun, mulberry, carob, mesquit, pomegranate, peaches & figs.	
Bannu	...	...	...	...	...	...	
II.—Very dry.							
Hissar	37 2 15	37 2 15	...	...	37 2 15	Orange, lemon, pomegranate, shisham, tun, kikar, mangoe and pipal.	
Kohat	15 1 20	1 3 29	...	...	1 3 29	Shisham, tut, eucalyptus.	Only 5 trees planted.
Peshawar	...	...	...	...	...	...	
Ferozepur	493 0 0	303 0 0	49 0 0	...	352 0 0	Shisham, kikar and farash &c.	
Karnal	311 1 10	311 1 10	...	...	311 1 10	Shisham, siris, nim, tut jaman, pipal.	
Rohtak	104 0 25	104 0 25	...	...	104 0 25	Shisham, kikar, nim, siris, mulberry, pipal, bakain, lasura, and mango.	Agarden laid out in the station.
III.—Dry.							
Lahore	...	...	...	...	...	...	
Ludhiana	...	...	...	...	...	...	
Jullundur	...	...	...	...	...	...	There are 23 plantations & 5 public gardens.
Amritsar	...	...	...	...	...	...	
Gujranwala	...	...	...	...	...	...	
Delhi	15 0 24	...	...	...	...	Kikar, nim, eucalyptus, bakain, shisham, jaman, mulberry, siris, pipal, tun, gular and pomegranate.	4406 trees at the beginning of the year.

District.	I	II	III	IV	V	VI	VII
	Area on which groves have been planted or are in course of construction.	Area stocked with trees or established plants at the beginning of the year.	Area planted during the year.	Area on which cultivation has failed or on which trees have been destroyed or felled.	Area stocked with trees or established plants at the end of the year.	Species of trees cultivated.	Remarks.
	Total area in acres.	*Acres.*	*Acres.*				
Gurgaon	...	...	...	...	...	...	220 trees planted.
Jhelum	...	...	...	...	...	...	12293 trees planted.
IV.-Forest Districts.							
Sialkot	...	...	...	...	...	...	
Gurdaspur	107 3 12	107 2 38	0 0 14	...	107 3 12	Shisham, mulberry, siris, orange, pomegranate.	
Gujrat	...	...	...	...	...	...	
Hoshiarpur	...	...	...	...	...	...	
Rawalpindi	29 0 0	...	...	...	...	...	5,458 trees were planted.
Hazara	70 0 0	70 0 0	...	...	70 0 0	Aru, bihi, anar, orange, gond, maju, hari, alucha, apple, alubukhara, mango, sangtara and deodar.	
Umballa	...	...	...	...	...	...	
Kangra	...	...	...	...	...	...	
Simla	...	...	...	...	...	...	
Total ...	2,143 3 0	1,593 1 39	160 0 37	104 1 26	1,649 1 10		

(*b*).—Detail of work done—Forest Avenues and Groves.

Arid Districts.

5. As already noted, the arid districts suffered most severely, and Sirsa reports that with regard to avenue planting ground was lost, and that all exotics tried in the district failed.

I would under these circumstances advise that no more money be spent on the introduction of exotics, and that at present all our energy be concentrated to re-wood such places where success is certain.

It has been said that it is a greater achievement to make a shady avenue across a sandy desert like the Thul in Muzaffargarh, than to rear plantations, groves and avenues in places where trees are easily grown. This is utterly wrong ; for in the first instance such artificial avenues can only be maintained at an inordinate expense even after they have been reared; and secondly, their establishment and maintenance is much facilitated and cheapened if forests, groves, plantations and avenues have first been established in likely places.

The systematic working proposed by the Deputy Commissioner of Sirsa, recommending the starting of arboriculture works from easily established centres of arboriculture is therefore recommendable, as well as the purchase of 423 acres of favourably situated land for a plantation. The wood and timber market at Sirsa is even now described as steady and good, and will improve when a railway crosses the district.

In many instances it is feared that the revenue subordinates do not consider district arboriculture a part of their legitimate duties ; but the establishment of

such plantations in specially selected areas will be much facilitated when each District officer can command the service of a forest officer, and I trust the scheme will, under those circumstances, obtain the favourable consideration of Government, be largely extended, and eventually become a work of large public utility and a source of a considerable income in many districts of the province.

The creation of such plantations is fully noted in the admirable circular issued by the Commissioner of Hissar, but I beg to be permitted to advise that in the schedules which Deputy Commissioners are asked to submit with their proposals for purchase of land, the following additions be made, *viz.* nature of sub-soil and distance of water from the surface in the surrounding wells during the driest months.

6. In the Shahpur district the planting at Sakesar deserves special notice. The work is apparently taken up systematically, and cannot under the circumstances fail to succeed. The rainfall is sufficient for arboriculture, and though at first the progress will be but slow, every additional acre successfully stocked and every year protection against grazing and fire will facilitate the cultural operations and insure a greater success. Of course grazing must be strictly kept out, but if this is done I have no doubt that the water supply will largely increase at Sakesar as the hill sides are wooded. The influence of forests on local water supply can be well studied in the country where I write the present report. Especially in the hills opposite Sultanpur, where large areas formerly fields have been thrown out of cultivation by careless extension of cultivation and grazing and consequent destruction of forests.

I would advocate that Sakesar be afforested with local trees and fir (*pinus excelsa*), and beg to warn that the too early attempts at once to introduce trees, which elsewhere under other conditions and circumstances yield more valuable timber, better shade, or are otherwise superior, will lead only too frequently to disappointment and the abandonment of an otherwise feasible and useful scheme.

I beg to advise that the system of trenching in contour as carried on in the Pubbi be largely employed at Sakesar. The advantages of the system have been described on several occasions, but as they almost entirely depend on the accuracy with which the work is carried out, it would, in my opinion, be well if some cooli mates or malies employed at Sakesar be sent to the Pubbi works.

The kikar groves in the plains of the Shahpur district, probably in localities where water is not far distant from the surface, the results of former sowings, deserve notice. The marketable value of wood in Shahpur is at present still very low, but all this will change with the construction of a railway.

7. There is nothing particularly noteworthy in the Multan report. The table pretending to show the state of arboriculture in the district at the end of the year is not correct, as it begins with no opening balance ; it, however, sufficiently shows that the percentage of death amongst the newly planted trees was very large.

In the Jhang district we have the same complaint, want of success on account of the long drought. The dates put out in the sandy sirkana grass-growing tracts did not germinate, but it is hoped that this will not lead to an abandonment of the scheme which can but be regarded with the greatest interest. I would advise as a most valuable experiment to start the dates in pots and to transplant them into the open. Of all avenues planted in the district, comprising 235,000 running feet, only the one to Kharosa (15,820 feet) is described as really flourishing ; all the more reason for the establishment of date groves, wherever possible.

The Montgomery district report does not contain anything of importance. Work in this district should be concentrated in the low-lying lands, where a good success can be obtained with a great degree of certainty.

8. The Muzaffargarh report destroys to some extent the favourable impression raised by that of last year, especially with regard to flourishing of groves established in the district, the areas of which are comparatively small, but still comprise 110 acres. The arboricultural operations of the year have been successful. After a visit to the district during the last cold weather, I quite concur with the Deputy Commissioner that to try at present to plant avenues along the dry road crossing the Thul would be waste of money, which can be spent more remuneratively on groves and avenues in more favourably situated localities. The district may be divided in three portions as regard arboriculture—(*a*) The Thul ; (*b*) the area subject to annual floods ; (*c*) the rest of the low-lying lands. In the Thul I think it would be advisable to plant only groves in low-lying valleys, similar to those which we find cultivated. These groves must be most scrupulously protected from browsing and grazing. I would recommend the cultivation at present only of Tamarix on these selected places, trees of which may in some places be seen in a flourishing condition away from wells, a sign that their tap-roots have reached a moist strata.

Hereafter it may be possible to introduce sissu and other more valuable trees, but their permanent introduction, if possible, for which I have no proof, will necessitate a much longer period of watering.

In the flooded portion of the district it is again extremely difficult, often impossible, to raise a continuous avenue, and it will again be preferable to raise groves of poplar and other trees which can resist an occasional flooding in specially selected places, but the main effort should in the first instance be concentrated in the unflooded low-lying country, pertaining nearly throughout of the character of sailaba and *par excellence* a tree-growing country, as is exemplified by some of the fruit avenues in the country.

Those near the station of Muzaffargarh are the best, as they have been most successfully protected from browsing and grazing.

The Deputy Commissioner takes objection to the manner in which arboricultural accounts are kept, especially to the way in which gardens, groves, and avenues are mixed up in this respect. I made the same objections in para 18 of my last year's report, and proposed a change which was approved of. This had evidently been overlooked, for the Muzaffargarh district alone did not attend to the new forms, and gives, though accompanied by a protest with regard to the utility of the figures, the financial results in a lump sum.

9. In the Dera Ismail Khan district only irrigated avenues are flourishing, and a few groves amongst which Dilkusha, near Bhakar, are said to be most beautiful. I cannot, without personal knowledge of the district, advise further steps than the creation of seed oases by means of irrigation.

From Dera Ghazi Khan it is reported that many young plants put out in 1882-83 died during this year's drought. The cultivation of the Khar hill is the most interesting part of this report. As regards this, however, I would advise to lean more towards the cultivation of local trees, or at least to grow olives and fruit trees apart from forest trees. Such mixtures as those of pepper trees and edible pines described in the Dera Ghazi Khan report, are extremely interesting in garden cultivation, but must be abandoned when we try to cover larger areas with forest vegetation.

10. From Bannu large failures in this year's operations are reported. The rainfall in the beginning of the year permitted planting and caused germination, but the midsummer drought counteracted all the good that had been done. The Deputy Commissioner proposes to increase the subordinate establishment wherever the water-supply is most scarce ; but I would advise that no unnecessary expense be incurred, and that cultivation be concentrated where success may be expected as a certainty, in localities where, as the Commissioner says, the conditions of water and soil are so favorable.

VERY DRY DISTRICTS.

11. From Hissar it is reported that it was only with great difficulty that nurseries and gardens could be preserved from ruin, and that practically nothing could be done in the way of extending avenues.

The purchase of land in the tracts subject to overflow of the Gagger was under contemplation, but the Revenue officer's time was so entirely occupied owing to the depressed state of agriculture throughout the district, that the scheme had to be postponed. An avenue was, it is reported, successfully planted between Hansi and the District bungalow, which, however, is not shown in the statement accompanying the report.

The Commissioner of the Hissar Division thinks that with the facilities of canal irrigation in the Hissar district, much more can be done than has been as yet attempted.

12. The arboricultural operations in the Kohat district hardly deserve mention ; only 247 trees were put out in avenues and groves, of which 79 per cent. it is reported have succeeded. In the Peshawar district 34,637 were planted out with fair success, so it is reported, and great attention was paid to existing avenues and groves.

The Deputy Commissioner states that mulberry thrives better than any other tree in his district ; but I quite agree with the Commissioner that great objections exist to the mulberry as a road-side tree, as it is full of insects in the fruit season, when rest in its shade for men and cattle is most desirable, and as it is much broken and hacked about for fruit and fodder.

13. In the Ferozepur district nearly 50,000 trees were planted, of which 44,500 are reported as having succeeded. 35,000 trees were planted in avenues the rest in groves.

The percentage of success, considering the large number of trees planted, is very creditable to Daroga Muhammad Yusaf, who is in charge of District arboricultural operations.

The Deputy Commissioner has a system by which he makes the men in charge of a certain avenue responsible for the death of trees for one year from the time of planting. They are fined one anna for each dead tree. This plan I would recommend to the attention of other District officers.

The Deputy Commissioner remarks on the marked increase of kikar and shisham trees since the introduction of district canals.

14. The Karnal report, I agree with the Commissioner, is a very meagre one, and the results of the year's operations seem in absence of more detailed explanation, even if making all due allowance for the extremely unfavorable year, hardly proportionate with the large outlay, which includes Rs. 2,388 for bhisties, and Rs. 606 for pakhalies, or nearly Rs. 3,000 spent on watering.

The season in the Rohtak district was also extremely unfavorable, but nevertheless a considerable amount of arboricultural work was done and with a fair success. The cost for watering was naturally very high, but out of 5,160 new trees planted only 1,379 died. The Deputy Commissioner reports that owing to the scarcity of fodder the branches of trees were lopped off by zamindars; the practice was checked, but it proves how useful and desirable a large extension of arboriculture would be in this district.

Dry Districts.

15. The year's rainfall in the Lahore district was about as unseasonable as it could be, but nevertheless the limited extension of new avenues and the repairs of old ones were successful. The existing avenues were repaired by the planting of 2,000 saplings and three miles of new avenues were planted. The Deputy Commissioner reports that as yet 4/5ths of all district roads remain unplanted, but many of these, it is justly remarked, are unfit to be planted, the soil being bad and water not available. The Deputy Commissioner is proposing a systematic plan for future operations with regard to the extension of avenues and groves, a scheme which I beg highly to recommend for adoption in all districts, as without a fixed plan too much is left to the idiosyncracy, not only of the district officers, but also of the subordinate revenue officials.

The District officer's report does not include operations within Municipal limits, for which, however, a separate statement is annexed, showing that 540 trees were planted on the Lahore roads, of which 39 only have died, showing that they know how to plant in Lahore.

2,092 trees were put out in Kasur, of which, however, 950 failed. The work done by the other Municipalities is hardly worth mentioning, I am sorry to say.

16. Ludhiana was one of the few places where the rainfall of the year is reported above the average, but even here the distribution was unfavourable.

9,287 trees were planted during the year, apparently with success. The Deputy Commissioner reports that he replaces gradually the bor and pipal by the more useful sissu and jáman, but that he endeavours to rear a good banyan or pipal tree for shade at every mile-stone. The idea is extremely good, as both pipal and bor are protected by religious precepts.

In the Jullundur district 9,120 trees were planted on the road-sides, of which only a few hundred have failed, so it is reported. The success, however, was only attained by a large increase in the watering establishment. The kikar avenue from Bagmara to Bazauli is rapidly dying out from old age, but the dead trees are at once replaced by sissu plants. It would be of interest if the age of this avenue was ascertained. Sissu succeeds admirably in the Jullundur district, and is at the same time a most valuable tree; it is therefore quite right to favour its cultivation in preference of any other timber tree, but I would again advise the large introduction of fruit trees.

17. In the Amritsar district 4,400 trees were planted along roads and fenced. The new work comprised the planting of two miles of single lines on the Tarn Taran-Jundiala road, of one mile in the Amritsar Civil lines, and the planting up of the Katcheri compound. The Deputy Commissioner complains that many parts of the district are not at all suited for arboriculture on account of kankar underlying the surface soil. In consequence the trees flourish and thrive for a few years, and then sicken and die.

The presence of kankar beds alone should not prevent the establishment of continuous avenues, and the plant holes, 4'×4,' should be broken straight through the kankar.

Of course such cultivation is expensive, but in the end cheaper than triennial replacing of young plants which never come to anything.

18. No new operations were undertaken in the Gujranwala district during the year, and only 3,400 trees were put out in places where trees planted in former years had died.

It is again reported that 101 young sissu and siris trees, of from 12 to 15 years of age, suddenly died in the Civil Station without any apparent reason. This is a question that ought to be cleared up without delay, and the local forest officer should be consulted. In my opinion, which however is not based on a detailed diagnosis, the reason must lie in the subsoil, and the whole root system of some diseased trees ought to be dug out and carefully examined.

It is gratifying to see that the Deputy Commissioner intends to introduce a more systematic plan of district arboricultural operations, by forming arboricultural Sub-Committees as soon as the local boards are constituted.

19. The Delhi report evinces that great interest is taken in arboriculture in that district, though the work of the year consisted mainly in the preservation of existing avenues. The Commissioner remarks that with an expenditure of above 6,000 rupees some new planting operations ought to have been undertaken, but I beg to point out that his expenditure includes upwards of 5,000 rupees spent by the Municipality, who maintain a permanent establishment costing 3,878 rupees. Another 739 rupees were expended on repairs of fences and enclosures.

In the villages of Assunla, where the fertile red soil belongs to Government, two large plots, aggregating over 50 bighas, have been enclosed with wall and ditch, and a tank has been dug near them. They will be planted, and doubtlessly such groves and little forests must become of immense benefit to the country.

It is also gratifying that efforts have been made to clothe the bare Ridge with trees. This will be both difficult and costly, but will hereafter benefit the community and show what can be done in the way of arboriculture when difficulties are systematically attacked ; and judging from the way works of this kind have been carried out in Delhi, I feel certain the Committee will succeed.

20. In the Gurgaon district the staff of bhisties had to be largely increased during the season owing to the excessive dryness and heat, lasting from June till autumn. Nevertheless considerable progress was made, and 14,128 trees were planted in avenues, of which 10,217 are said to have succeeded.

The Gurgaon district suffers frequently from drought and hot winds, but the spring level is generally not very deep, and trees establish themselves permanently in two to three years, which greatly facilitates arboriculture and insures success.

In the Jhelam district, as far as I can make out from the report, the number of trees planted amounted to 5,169, of which 1,252 died ; which shows an increase over last year's operations, but the district is favorably situated amongst the dry districts, and should excel in arboricultural operations.

Forest Districts.

21. Even the Sialkot district complains about the bad season. No new avenues were planted, partly on this account, partly for want of suitable plants. Blanks were filled up and two groves of mangoe trees were planted, the one on

spare land at Talwandi, the other on the encamping ground near Damtal. The Deputy Commissioner does not propose to undertake a future extension of arboricultural operations in his district, but to devote his whole energy to the maintenance of existing avenues and groves. The length of the district roads is over 1,300,000 of feet, and only 900,000 of feet of single lines have been stocked, so that if all avenues consisted only of two lines of trees, 450,000 feet of road would be completed, leaving 850,000 feet of road unstocked. Under these circumstances it seems rather premature to stop the future extension of new avenue planting, especially as the district is so eminently adapted to arboriculture.

22. The report of the Gurdaspur district deserves a careful study, for not only have much better results been attained for many years, but a methodical way of dealing with the arboriculture of the district has been introduced.

12,127 trees are said to have been planted on the road sides, and 15,416 elsewhere, but the Deputy Commissioner himself says that the figures cannot be taken as quite reliable; on the whole, however, he is satisfied with the work as carried on under the supervision of the Tahsildars. A most interesting account is added to Colonel Harcourt's report regarding the period of leaf-shedding of the various trees, which certainly is of great importance for the planting of avenues and gardens, a fact which I had up till now never sufficiently recognized. I shall however take advantage of the hint for future use.

23. The rainfall of the Gujrat district was neither plentiful nor seasonable, a large break occurring between the middle of July and September; however the Deputy Commissioner is satisfied, and out of 1,182 trees planted out only 50 have died. The operations are, considering that the district is so very favourably situated for arboriculture, in my opinion, hardly sufficiently extensive.

From the Hoshiarpur district also it is reported that owing to inefficient rainfall no progress has to be recorded, the energies of the establishment being solely devoted towards maintaining planting of previous years.

The death of many established tun and siris trees is ascribed to the effects of the long drought.

The total mileage of roads in the district is given as 712 miles, the length planted as 438 miles. Last year's statement gives total length 438 miles, length of avenues 277. The establishment costs Rs. 5,630, and no new operations were undertaken. I quite concur with the Commissioner that the progress is unsatisfactory. Nearly Rs. 12,000 were obtained from wood from trees cleared out in a year which was specially dry, and in which apparently nothing was done to replace them. The clearances effected are reported as satisfactory in the extreme, but it would appear from the report that thinning had not been carried on so successfully, and that the trees were disfigured and mutilated.

The revenue is large, but without a more detailed explanation than is contained in the report, hardly justifies such extensive clearances.

24. The progess reported from the Rawalpindi district is satisfactory. It is stated that 85,466 trees were planted in avenues, and that only 7,272 of these died, also that 110 groves have been established, aggregating 29 acres. Into these 5,428 trees were planted. The arboricultural operations of the Municipalities of the district are also reported as successful; for of 2,439 trees planted in Rawalpindi only 40 failed, and only 89 died out of 606 planted by the smaller Municipalities.

The tree planting is carried on by the zamindars under the direct management of the Tahsildars assisted by the tahsil overseers.

From the Hazara district it is reported that for the first time autumnal and winter planting has been tried, and so far successfully. Some 30 deodar trees ten to twenty feet high have beeu transplanted in the Abbottabad gardens, and have succeeded, as well as some other large timber and fruit trees.

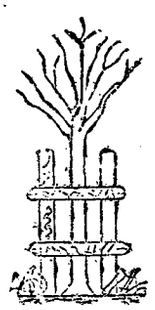
1,200 trees have been planted along the Dhobi-ghat road. The position and ground is very unfavourable, and I would propose that the trees be planted in future in such localities on little mounds of earth which may be as high as three feet if the ground is very swampy in winter. Mr. Wild will be able to advise the Deputy Commissioner on this point.

In the Amballa district the Deputy Commissioner reports nothing could be done, on account of the long drought, but the filling up of gaps by the planting of 1,964 trees, of which 1,341 are said to have been successful; and against this the death has been reported of 356 established trees and 2,375 plants of last year's planting. This is much to be regretted and might doubtlessly have been prevented, as in other districts, by an increase in the staff of bhisties. A somewhat increased expenditure would have been true economy in this instance.

25, In the Kangra district 29,083 trees were put out, but only 53 per cent. are reported successful. Of the trees planted 7,058 were put out in Kullu proper and 11,693 in Plach. The comparatively large number of casualties amongst the plants is attributed to the bad season, but this ought not to have affected Kullu and Plach to the degree noted. For many years now attempts have been made to grow avenues in Kangra and Kullu, and though perhaps nowhere in the Punjab are the conditions for arboriculture more favourable, the avenues are in much the same state as they were fourteen years ago, and they will remain in that state of struggling infancy till the system is entirely changed. The failures are due to nothing else but the large herds that pass along the road, and browse the young trees, and cripple them if they do not destroy them.

Some good has been done in Kullu by closing the road between Sultanpur and Raisan against the passage of sheep, but this cannot be done anywhere, and the only method that will answer under these circumstances is the establishment of some large nurseries for the growth of high-stemmed plants. And no road-side plants should be put out in such localities that have a branch or leaf below eight feet from the ground.

Of course such plants would have to be propped up for a couple of years between two poles like this, and the operations would be somewhat costly, but success would be insured, and it would in the end be cheaper than to grow every year a lot of small road-side plants for sheep fodder. For Kullu and Plach I would recommend the planting of high-stemmed apple trees, and walnut in the higher localties. My remarks with regard to the rearing of the necessary plants will be found in the paragraph treating of nurseries. An arboricultural report has also been received from the Simla Municipality.



(c.)—Government Gardens.

The reports on Government gardens, ornamental or otherwise, are in many instances not very exhaustive, and I feel certain that infinitely more good is done by the maintenance of "Company bághs" than is recorded.

In fourteen districts Government gardens are not mentioned at all, and in some others, gardens, groves and nurseries have been mixed up. I would beg to

propose that in all future reports a clear distinction be made, and beg to submit the following definition for general adoption. Amongst nurseries only such areas should be included, which are used for the actual growing of planting material. They may be divided into sowing nurseries where plants are reared from seed, and planting nurseries where plants are put out to be trained up for some particular purpose. Such nurseries may form part of a forest, grove and ornamental garden, but under these circumstances should always be treated of separately and excluded from the area of such forest garden or grove.

A grove which is sown *in situ* is not a nursery.

A grove should for the purposes of future arboricultural reports, be any area stocked with trees only, but not of sufficient extent to be cultivated and utilized by rotation, and therefore to be classed as a forest; they would comprise areas such as planted encamping grounds, mango topes, &c.

As Government gardens, only such areas should be classed as are cultivated for mainly ornamental and gastronomic reasons, areas in which forest trees, artichokes, exotics, and asparagus, fruit trees, cauliflowers, flowering bushes, grapes and flowers, may be grown. There are many such gardens in the province, which are both ornamental and useful to a high degree, and are most carefully treated.

The Khar garden in Dera Ghazi Khan, containing a very varied assortment of trees, comprising olives, eucalypti, cypress, juniper, the carob and pepper tree, deserves special notice, and the Deputy Commissioner of Dera Ghazi Khan states that a handsome ornamental garden, established by the Municipality only two years ago, is becoming the lounge of the station. The Multan public gardens are reported to contain 9,940 trees of many varieties, and those of Sialkote, containing large quantities of grafted mangoes and other fruit trees, are entirely self-supporting. This of course should be the aim of all the Government gardens, especially near large stations. Both in the Rawalpindi and Hazara districts are large areas of ornamental gardens, containing many valuable fruit trees in addition to ornamental ones.

From Jhelum it is reported that 9,254 fruit tree cuttings were planted during the year, of which only 1000 died. I think it would be advisable that next year's reports should contain a concise description of all Government gardens in existence in each district, and that hereafter only new works or alterations should be noted.

(*d*).—Nurseries.

The following statement contains, as far as information has been vouchsafed to me, the state of nurseries in each district.

The continuous maintenance of a stock of plants best adapted for the purpose for which they are intended, is of the greatest possible importance, and neglect in that respect necessitates often the temporary abandonment of most desirable operations, or leads to the use of unsuitable material. I have already been obliged to make remark to this effect in my Forest progress reports, with regard to the neglect in the establishment of deodar nurseries in several Hill Divisions; and to judge now from the reports before me, I feel convinced that in many districts but insufficient attention is paid to this most important part of district arboriculture, and I beg to advise that a more detailed report be asked for with regard to this question.

Nine districts do not mention the subject, and from Amballa it is stated that there were four nurseries in the beginning of the year, and now there is one,

which seems hardly sufficient guarantee that the question of the supply of planting material for future operations is secured in this district; and from Sialkote it is reported that operations had to be abandoned as no provision had been made for the necessary plants.

In most districts, however, I am glad to note, the importance of the question is recognized, and I gather either from the body of the reports or the forms that a good deal of attention has been paid to raise a sufficiency of plants.

I take this opportunity of advising the more general establishment of planting nurseries in which to train plants with high stems specially adapted for road planting, where damage by cattle, sheep or goats is the order of the day. I have already remarked to this effect when discussing the planting of road-side trees in the Kangra district including Kullu, and beg again to state that it is quite feasible to train 6,000 to 7,000 plants per acre with branches and leaflets beginning at 8 feet from the ground only. Such material will be quite hardy, though at first somewhat lanky, so that for two years side supports will be required.

Avenue planting in this way will be somewhat more expensive at the outset, but in the end prove true economy. Camping-grounds and topes should be planted in the same way.

In Kullu, parts of the Kangra, Hazara, and Simla districts, I would advocate the growing of high-stemmed apple-trees and of walnuts in the high localities. In the outset it may perhaps be advisable to obtain a few thousand trees from Germany, where high-stemmed fruit trees are specially trained for avenue planting, but there should be no difficulty to grow our own material in future.

The bulk of the trees should be of the sort yielding the common cooking and drying apples, though more high class fruit trees may be planted near stages and camping-grounds.

The attached statement would show that only 17 acres of new nurseries were established throughout the province, but I trust that the statement is wrong.

Progress Statement of Nurseries planted in districts during the year 1883-84.

	I.	II.	III.	IV.	V.	VI.	VII.
DISTRICT.	Total area of land set apart for nurseries.	Area stocked with plants at the beginning of the year.	Area sown or planted during the year.	Area on which cultivation has failed or from which plants will be removed.	Area stocked with trees or established plants at the end of the year.	Species of trees cultivated.	REMARKS.
I.—ARID.	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*		
Sirsa ...	3 0 0	...	...	...	...	Shisham, pipal, nim, jaman, kachnar, pomegranate, kikar, and siris.	11,948 trees at the beginning of the year, 3,100 planted during the year.
Shahpur ...	1 1 22	0 0 10	1 1 12	0 0 5	1 1 17	Mangoe, pomegranate and almonds.	
Mooltan ...	...	...	...	...	...		
Jhang ...	0 1 18	0 1 12	0 1 18	...	0 2 30	Mangoe, gulnister, siris and vine.	
Montgomery ...	...	...	...	...	...		
Muzaffargarh ...	29 2 2	29 2 2	4 0 0	5 0 0	28 2 2	Shisham.	
Dera Ismail Khan ...	...	...	...	...	...		
Dera Ghazi Khan ...	4 2 0	4 2 0	...	...	4 2 0	Shisham, kikar, mangoe jaman, firs, mulberry, plums, peaches, lime, oranges, &c.	
Bannu ...	...	...	...	...	...		

Progress Statement of Nurseries planted in districts during the year 1883-84.—Concluded.

District.	I Total area of land set apart for nurseries.	II Area stocked with plants at the beginning of the year.	III. Area sown or planted during the year.	IV Area on which cultivation has failed or from which plants will be removed.	V. Area stocked with trees or established plants at the end of the year.	VI. Species of trees cultivated.	VII. Remarks.
	Acres.	*Acres.*	*Acres.*	*Acres.*	*Acres.*		
II.—Very Dry.							
Hissar ...	13 1 11	13 1 11	...	...	13 1 11	All kinds of forest trees, and kikar.	
Kohat ...	...	...	...	...	...	...	
Peshawar ...	...	...	...	...	...	...	The number of nurseries same as last year.
Ferozepore ...	...	...	...	...	...		
Karnal ...	8 1 30	8 1 30	...	...	8 1 30	Various sorts.	
Rohtak ...	1 1 23	1 1 23	...	...	1 1 23	Shisham, nim, amaltas, mulberry, mangoe, kikar, &c.	
III.—Dry.							
Lahore ...	...	...	...	...	...	...	A small nursery of 1,000 trees opened at Bado.
Ludhiana ...	...	...	...	...	...	...	5 nurseries in the district.
Jullundur ...	10 3 1	5 0 7	6 2 9	...	11 2 16	Shisham.	
Amritsar ...	...	...	...	...	...	...	3 nurseries at Sadr Chogam and Tarn Taran.
Gujranwala ...	...	...	...	...	...	...	21 kanals laid out in Gujranwala and Hafizabad tahsils.
Delhi ...	1,209 1 37	...	...	...	...	Shisham, siris, jaman, nim, kachnal, mulberry kikar, ber, pipal, khatta, gular, mangoe, and pomegranate.	91,127 trees at the beginning of the year, none planted during the year.
Gurgaon ...	...	...	...	...	...	...	13 nurseries containing 12,818 trees of which 8,169 planted during the year.
Jhelam ...	...	...	...	...	...	...	
IV.-Forest Districts.							
Sialkot ...	12 2 8	4 1 2	3 1 20	...	7 2 22	Mangoe, bahera, amaltas, siris and mulberry.	
Gurdaspur ...	8 3 18	8 2 16	0 1 2	0 0 3	8 3 15	China, mulberry, anar, shisham, orange and siris.	
Gujrat ...	...	...	...	...	...	...	Only 3 small nurseries.
Hoshiarpur ...	...	...	...	...	...	...	
Rawalpindi ...	...	...	...	...	...	...	Nurseries at Rawalpindi and Chattar gardens only.
Hazara ...	317 1 17	26 1 17	2 0 0	...	28 1 17	Chir, gond, drek, tut, charbi, akhrot, phulai, alucha, sarin, tali, chinar, golab, aru, alubukhara, &c.	
Umballa ...	...	...	...	...	...	...	Out of 4 nurseries one remaining.
Kangra ...	...	...	...	...	...	Tun, shisham, mangoe, khirik, jaman, mulberry, siris, &c.	The number of nurseries same as last year, no new ones planted.
Simla ...	...	...	...	...	...	...	
Total ...	1,620 3 27	101 3 10	17 3 21	5 0 8	114 2 23		

(*e*). Cattle trespass and Lopping.

I do not think the subject of trespass, especially of cattle trespass in avenues and groves, receives as yet sufficient attention throughout the Province, and in almost every district I have visited during the year I have seen traces of trespass by cattle.

The Deputy Commissioner, Gujranwalla, says it would be easy to put a stop to cattle trespass by taking vigorous measures for the prosecuting of owners who allowed their cattle to trespass and destroy the avenues on the road-side.

Doubtlessly something may be effected by these means, for at present such trespass is hardly regarded as an offence in many places, and herdsmen allow any one to ride up quite confidently, without even then chasing their animals from browsing road-side plants. Most exposed to cattle trespass are those districts in which large herds of goats and sheep pass along the road, and again where camels are driven along. The goats and sheep can be kept from browsing only by the most thorough and expensive fencing and by planting specially grown saplings, and camels should always be muzzled whenever they are driven along an avenue.

Of course much can be and is done by fencing, which, however, is very expensive when done well, and utterly useless if nothing but a few stones and brambles are put round the plants.

Successful fencing with reed has been reported from Muzaffargarh, and in Sialkot trees are protected by fences of Euphorbia plants and thorn bushes. In Rohtak the trees are protected by stout thorn fences, as well as in Gurgaon, where impenetrable thorn fences to the height of 4 feet are put round the trees.

Such fencing of course is effective. The thorn fencing in the Kullu valley is better than I have seen it on former visits, but is even yet insufficient to protect the plants from the large flocks. There are only two possibilities of insuring success, *viz.*, the closing of parts of the road till the avenue plants have outgrown all danger of being browsed, or the planting of large high-stemmed plants. The former method has been adopted by Mr. Dane on a short stretch of road between Sultanpur and Raisan.

Lopping of road-side trees has received considerable attention throughout the province, but nevertheless several cases have again been reported when trees were mutilated and damaged.

In most districts the work is done under the supervision of men specially instructed in the work.

Particular attention should always be paid that saws and hatchets are sharp and in good order.

I saw trees hacked about close to Lahore a few months ago, and on enquiry found that the saws were so blunt that they would not cut a branch, and the hatchets with which the work was done were not much better.

The worst form of lopping is carried on by the zamindars of trees growing in the fields and village wastes. Big branches are lopped and torn off with the most crude intruments, so that the sheep and goat may be able to feed on the leaves. I have seen hundreds and hundreds of kikar trees mutilated in this way throughout the province, but more specially in the southern districts.

This is a subject deserving the District officer's close attention. I do not mean to say that the kikar growing in fields should yield no leaf fodder at all, but only that the lopping should be done somewhat more carefully and sparingly.

(*f*).—Financial.

The following tables represent the financial results of the year. Several districts did not send me the returns in the prescribed forms, and it was with considerable difficulty that I analyzed the financial results by the help of the notes accompanying the statements. I am not always sure that my analyses are correct, and I have therefore entered these figures in italics.

INCOME.

District.	I.—ORNAMENTAL GARDENS.							II.—NURSERIES.						
	Lopping.	Thinning.	Dead trees.	Fruit.	Plants.	Grass.	Miscellaneous.	Lopping.	Thinning.	Dead trees.	Fruit.	Plants.	Grass.	Miscellaneous.
I. ARID.														
Sirsa	...	...	...	378-0-0	...	...	16-0-0	...	...	...	17-0-0	...	...	8-0-0
Shahpur	...	...	...	*680-0-0*	...	...	...	...	...	...	...	...	...	...
Mooltan	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhang	...	...	...	*319-1-8*	...	...	...	...	...	...	...	...	...	...
Montgomery ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Muzaffargarh ...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
Dera Ismail Khan...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera Ghazi Khan	...	...	83-0-0	35-0-0	...	...	...	...	...	...	...	...	...	...
Bannu	...	...	...	...	...	...	...	...	...	...	...	...	...	...
II. VERY DRY.														
Hissar	...	...	20-0-0	229-0-0	...	...	...	...	...	25-0-0	...	...	...	...
Kohat	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawar	...	...	...	46-0-0	...	...	...	...	...	...	...	...	...	...
Ferozepur... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Karnal	...	...	...	*55-0-0*	...	...	...	...	...	...	...	...	...	...
Rohtak	...	...	...	...	...	...	...	...	...	...	...	...	...	...
III. DRY.														
Lahore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ludhiana	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur	1-0-0	...	49-0-0	466-0-0	96-0-0	...	275-0-0	...	1-0-0	...	...	46-0-0	2-0-0	71-0-0
Amritsar	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gujranwala ...	...	...	...	131-0-0	1-0-0	...	...	...	...	...	...	...	...	...
Delhi–District Fund	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. Municipal ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gurgaon	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelam	...	...	...	*450-0-0*	...	...	...	...	...	...	...	...	...	...
IV. FOREST DISTRICTS.														
Sialkot	...	...	...	1331-0-0	703-0-0	350-0-0	...	...	...	...	...	...	...	...
Gurdaspur... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gujrat	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshiarpur ...	...	...	...	*20-0-0*	...	...	...	...	...	...	...	...	...	...
Rawalpindi ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazara	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa	...	...	...	*259-8-0*	...	...	*194-0-0*	...	...	...	...	...	...	...
Kangra	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Simla	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL... ...	1-0-0	...	152-0-0	4,399-9-8	800-0-0	350-0-0	485-0-0	...	1-0-0	25-0-0	17-0-0	46-0-0	2-0-0	79-0-0

INCOME.

III.—AVENUES AND GROVES.							IV.—AFFORESTED WASTES.							Grand Total.	Remarks.
Lopping.	Thinning.	Dead trees.	Fruit.	Plants.	Grass.	Miscellaneous.	Lopping.	Thinning.	Dead trees.	Fruit.	Plants.	Grass.	Miscellaneous.		
75-0-0	4-0-0	33-0-0	...	...	...	...	...	...	...	...	...	...	...	531 0 0	
...	...	*329-0-0*	...	...	*305-0-0*	...	...	...	...	...	...	...	...	*1,314 0 0*	
302-10-0	...	*46-0-0*	...	...	...	...	...	...	...	...	...	...	...	*348 10 0*	
511-15-6	...	...	...	...	...	...	...	...	...	...	...	...	...	*831 1 2*	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	543 0 0	
115-8-0	...	...	...	...	110-0-0	...	...	...	...	...	...	...	...	225 8 0	
40-0-0	...	9-0-0	...	...	...	...	...	...	...	...	...	...	...	167 0 0	
69-0-0	...	...	...	...	...	...	...	...	...	...	...	...	...	69 0 0	
...	...	41-0-0	...	...	...	...	...	...	...	...	...	...	...	315 0 0	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
79-0-0	12-0-0	19-0-0	...	...	...	...	...	...	...	...	...	...	...	156 0 0	
386-8-3	...	455-5-9	39-4-6	...	584-0-0	43-7-0	...	...	...	...	...	...	...	1,508 9 6	
...	...	*58-0-0*	...	...	...	...	...	...	...	...	...	...	...	*113 0 0*	
25-0-0	...	197-0-0	...	...	...	...	...	...	...	...	...	...	...	222 0 0	
25-0-0	108-11-0	342-8-0	10-0-0	3-0-0	...	...	...	...	...	...	...	...	...	489 3 0	
523-0-0	275-0-0	1,066-0-0	...	...	774-0-0	...	...	...	...	...	...	...	...	2,638 0 0	
11-0-0	5-0-0	2,782-0-0	1-0-0	...	498-0-0	2-0-0	...	...	...	...	...	...	...	4,497 0 0	
1,568-0-0	...	...	...	...	...	...	...	...	...	...	...	...	...	*1,568 0 0*	
114-0-0	...	381-0-0	...	...	...	...	...	...	...	...	...	...	...	627 0 0	
14-3-0	...	1,077-3-9	...	...	...	...	...	...	...	...	...	...	...	1,091 6 9	
...	...	*1,189-0-0*	...	...	*2,681-0-6*	...	...	...	...	...	...	...	...	*3,870 0 6*	
...	...	*714-2-6*	...	...	*111-7-0*	...	...	...	...	...	...	...	...	*825 9 6*	
663-0-0	...	...	...	...	...	...	...	...	...	...	...	...	...	*1,113 0 0*	
227-0-0	156-0-0	3,929-0-0	3-0-0	...	731-0-0	...	...	...	...	...	...	...	...	7,430 0 0	
...	...	*1,334-0-0*	...	...	...	...	...	...	...	...	...	...	...	*1,334 0 0*	
741-0-0	...	...	...	...	...	...	...	...	...	...	...	...	...	*741 0 0*	
...	*12,328-0-0*	...	...	...	*256-0-0*	*1,531-0-0*	...	...	...	...	...	...	...	*14,135 0 0*	
97-0-0	...	...	...	...	...	...	...	...	...	...	...	...	...	79 0 0	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	*2,075 0 0*	
...	...	*1,434-4-0*	...	...	...	...	...	...	...	...	...	...	...	*1,887 12 0*	
...	...	*182-2-7*	...	...	...	...	...	...	...	...	...	...	...	*182 2 7*	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
5,587-12-9	12,888-11-0	15,618-10-7	53-4-6	3-0-0	6,050-7-6	1,576-7-0	...	...	...	...	...	...	...	50,944 15 0	

The income of the year is noted at Rs. 50,944-15-0, which is a considerable increase on that of last year.

The income from Government gardens represents a total of Rs. 6188; for nurseries an income of Rs. 361 were realized. This total contains Rs. 208 for sale of fruit, a certain sign that the term "nursery" was misinterpreted.

The income from groves and avenues is noted as Rs. 41,778. Of this, however, the income of the Delhi *belas* at least should have gone to afforested wastes, I think.

EXPENDITURE.

DISTRICTS.	I. ORNAMENTAL GARDENS.		II. NURSERIES.		III. MAINTENANCE & REPAIRS OF ESTABLISHED AVENUES & GROVES.		IV. EXTENSION OF AVENUES & GROVES.		V. AFFORESTATION OF WASTE LAND.		Grand Total.	Surplus.	Deficit.
	A Working.	B Establishment.	A Working.	B Establishment.	A Working.	B Establishment.	A Working.	B Establishment.	A Working.	B Establishment.			
I.—ARID.													
Sirsa ...	531 0 0	488 0 0	194 0 0	142 0 0	1 0 0	284 0 0	...	...	3,450 0 0	...	5,090 0 0	...	4,559 0 0
Shahpur ...	1,348 0 0	...	129 0 0	...	962 0 0	2,384 0 0	...	...	...	...	4,823 0 0	...	3,509 0 0
Mooltan ...	...	...	120 0 0	...	1,998 13 3	3,153 0 0	...	...	...	...	5,271 13 3	...	4,923 3 3
Jhang ...	200 0 0	1,292 0 0	120 0 0	...	2,851 0 0	...	...	...	...	...	4,463 0 0	...	3,631 14 10
Montgomery ...	...	...	...	...	201 0 0	915 0 0	...	...	...	...	1,116 0 0	...	1,116 0 0
Muzaffargarh ...	2,257 6 3	...	...	...	6,541 0 0	...	...	...	...	...	8,798 6 3	...	8,255 6 3
Dera Ismail Khan ...	...	...	...	...	...	1,356 0 0	207 0 0	180 0 0	...	...	1,743 0 0	...	1,517 8 0
Dera Ghazi Khan ...	432 0 0	948 0 0	384 0 0	...	...	3,738 0 0	385 0 0	1,020 0 0	...	...	6,907 0 0	...	6,740 0 0
Bannu	339 4 0	...	116 9 9	...	58 0 0	841 7 6	...	...	...	...	1,355 5 3	...	1,286 5 3
II.—VERY DRY.													
Hissar	792 0 0	696 0 0	240 0 0	564 0 0	223 0 0	530 0 0	120 0 0	149 0 0	...	...	3,314 0 0	...	2,999 0 0
Kohat	...	...	...	...	...	...	...	364 0 0	...	...	364 0 0	...	364 0 0
Peshawar	...	...	10 0 0	...	42 0 0	3,665 0 0	16 0 0	...	...	...	3,733 0 0	...	3,577 0 0
Ferozepur	...	...	...	...	5,917 2 0	1,212 0 0	...	...	...	...	7,129 2 0	...	5,620 8 6
Karnal	...	...	288 8 10	503 2 8	1,199 0 2	3,738 2 11	...	...	...	...	5,728 14 7	...	5,615 14 7
Rohtak	...	...	...	673 0 0	...	5,538 0 0	368 0 0	200 0 0	...	...	6,779 0 0	...	6,557 0 0
III.—DRY.													
Lahore	...	...	...	...	648 5 0	1,735 8 0	...	...	...	...	2,383 13 0	...	1,894 10 0
Ludhiana	...	...	46 0 0	264 0 0	476 0 0	3,792 0 0	...	...	...	...	4,578 0 0	...	1,940 0 0
Jullundur	1,023 0 0	1,118 0 0	1,123 0 0	1,369 0 0	121 0 0	1,018 0 0	130 0 0	94 0 0	...	...	5,991 0 0	...	1,494 0 0
Amritsar	...	...	...	...	...	...	...	...	...	...	7,632 0 0	...	6,064 0 0
Gujranwala... ...	...	679 0 0	295 0 0	...	60 0 0	2,359 0 0	50 0 0	...	...	...	3,443 0 0	...	2,816 0 0
Delhi D. F.... ...	...	...	...	...	472 13 0	2,028 15 7	...	...	...	...	2,501 12 7	...	1,410 5 10
Do. M. F.... ...	...	...	137 3 4	528 0 0	739 9 11	3,617 14 3	...	...	100 0 0	...	5,122 11 6	...	1,252 11 0
Gurgaon	...	...	...	450 0 0	2,971 15 6	1,666 13 6	...	...	...	...	5,088 13 0	...	4,263 3 6
Jhelum	2,990 0 0	...	815 0 0	...	1,117 0 0	...	...	...	...	...	4,922 0 0	...	3,809 0 0
IV.—FOREST DISTRICTS.													
Sialkot	1,552 0 0	1,427 0 0	131 0 0	225 0 0	86 0 0	2,433 0 0	...	...	88 0 0	216 0 0	6,158 0 0	1,272 0 0	...
Gurdaspur	...	840 0 0	120 0 0	...	1,067 0 0	511 0 0	...	...	...	...	2,538 0 0	...	1,204 0 0
Gujrat	...	...	...	...	...	1,315 0 0	...	...	...	...	1,315 0 0	...	574 0 0
Hoshiarpur... ...	...	...	...	...	219 0 0	5,630 0 0	...	...	...	...	5,849 0 0	8,286 0 0	...
Rawalpindi... ...	...	...	...	...	...	...	...	...	...	...	5,943 0 0	...	5,846 0 0
Hazara	...	...	...	...	328 0 0	2,729 0 0	...	...	...	...	3,057 0 0	...	982 0 0
Umballa	...	...	...	...	57 9 4	2,032 0 0	...	...	...	...	2,089 9 4	...	201 13 4
Kangra	...	...	512 0 0	...	466 0 0	192 0 0	...	...	...	...	1,170 0 0	...	987 13 5
Simla	...	...	3,405 12 0	...	...	...	...	...	...	...	3,405 12 0	...	3,405 12 0
TOTAL ...	11,464 10 3	7,483 0 0	8,187 1 11	4,718 2 8	28,824 4 2	58,414 13 9	1,276 0 0	2,007 0 0	3,638 0 0	216 0 0	1,39,804 0 9	9,558 0 0	98,417 1 9

Deficit=Rs. 88,859 1 9

The expenditure, it will be seen, amounts to Rs. 1,39,804, representing a very considerable increase, which is to a great extent explained by the largely increased cost of watering consequent to the severe drought throughout the Province.

The statement does not as yet give a sufficiently clear *resumè* of the expenditure, and in many instances bhisties and malies who are working people have been entered in the establishment. This may be the fault of the table which I compiled, and which I tried to keep as general as possible. This however, has led to many misunderstandings, and I would therefore recommend that the expenditure side be still more detailed as follows :—

(*a.*) Supervision and protection, including daroghas, jemadars &c.
(*b.*) Cultural operations, including malies, planting coolies &c.
(*c.*) Watering, including bhisties, pakals &c.
(*d.*) Fencing.
(*e.*) Lopping and pruning.
(*f.*) Felling.
(*g.*) Communications and buildings.
(*h.*) Purchase of land.
(*i.*) Miscellaneous.

Should His Honor approve, I will substitute this detail in the present form which will make any furthur misunderstandings quite impossible. The division of the expenditure under ornamental gardens, nurseries, maintenance of existing avenues, &c., will of course be maintained.

I intend again to send the necessary blank forms to each District officer, but this time with instructions regarding the filling up printed on each form.

You will observe that the total expenditure for ornamental gardens amounts, according to the statement, to 18,947 rupees. They are not therefore self-supporting as yet.

Several districts note no expenditure under this head, which can hardly be correct.

The main expenditure is under maintenance and repairs of existing avenues ; and under afforested wastes, the purchase of land at the cost of 3,450 rupees has been entered.

The year's transactions show a deficit of Rs. 88,859.

C.—DEVELOPMENT OF ARBORICULTURE BY PRIVATE PERSONS.

In a year so thoroughly unfavourable as that we have just left behind us, a large development of arboriculture by private enterprise cannot be expected, nor has it taken place, and we must rest satisfied that the importance of the subject has been almost generally recognized, not only by officials, but by many District Committees.

The actual practical results of the year are few, and the operations were not always entirely voluntary, which, however, in my opinion would be almost too much to expect from a people who have never as yet recognized the advantages derivable from arboriculture and who have not as yet been taught to do so.

In the Shahpur district the conditions of the settlement, which most wisely provide that two marlas of land should be planted with trees round each well, have now been enforced in the Bhera and Shahpur tahsils. From Dera Ghazi Khan it is

reported that the distribution of young fruit trees has awakened the interest of many zamindárs, and that they have begun to plant trees round graveyards; and the Deputy Commissioner, Ferozepur, writes that large numbers of trees are successfully grown by zamindárs on the canals which traverse their lands, the Nawab of Mamdot setting them a splendid example. This nobleman has raised 50,000 trees on his canals during the present year.

In the Delhi district the zamindárs in several villages have made over plots of land of considerable size to the Committee on the condition that a tank is dug at the Committee's cost, who also undertake the planting, fencing and guarding of the area. The property of the soil remains with the landholder, but the Committee will receive half the value of the timber crop. Tanks are now being dug, and the plan is, I think reasonably so, expected to be very successful, and deserves imitation in other districts.

In Gurdaspur five fruit trees are made over to zamindárs free of charge, and more, if demanded, at a nominal rate. The same is done in Hazara, and 2,154 young trees were thus given away, but the Deputy Commissioner reports that the zamindars do not as yet take kindly to arboriculture. The Deputy Commissioner of Rawalpindi does not give any detail, but generally states that landed proprietors begin to take an interest in the cultivation of fruit trees.

The Deputy Commissioners of Sirsa, Bannu, Rohtak, and Gurgaon report that no arboricultural operations have been undertaken during the year in their districts. Schemes were prepared by them and the District Committees to extend arboriculture by private enterprise, and the Commissioner of the Hissar Division is taking great interest in these schemes.

The Deputy Commissioner of Amritsar complains of the apathy of the zamindars and proposes also a system of rewards and of *parwánás khushnúdi miżáj* to awaken the necessary interest.

The Deputy Commissioner of Ludhiana reports that though all sorts of useful trees are distributed gratis to zamindars, for planting in their gardens or near their wells, applications for them are but rarely made, and that as yet no thorough interest has been awakened.

The Deputy Commissioner is of opinion that no general and thorough improvement in private arboriculture will be effected throughout the province without legislation on the subject.

This matter deserves most serious consideration, and I trust I may be permitted to quote a few examples from continental forest history touching on the subject.

The present wealth of the Lunebourgh peasant is entirely due to some very stringent but wise regulations introduced by one of the Guelphic ancestors of our Most Gracious Majesty, by which the landowners were ordered to plant a certain number of oak saplings every year, and by which the felling of any immature oak tree was forbidden. At the time this was considered a great hardship, but at present the villagers are quite aware that a great portion of their wealth lies in their oak groves and pine forests, which are as well treated and protected as any forest belonging to Government.

Again large portions of the county of Aurich were nothing but sandy dunes, constantly shifting and preventing or destroying cultivation. A few poor cultivators and shepherds inhabited the district when Napoleon I. ordered the sand dunes to be planted with Scotch fir, and issued a most stringent manifesto with regard to their protection. It is said by detractors of a great administrator that this was

done to secure an additional military road, but whatever may have been the reason the results are that the grandchildren of the poor inhabitants are well-to-do peasants.

The zamindars of the Punjab are perhaps hardly sufficiently advanced to undertake entirely voluntary large arboricultural operations, the results of which will only benefit their children and grandchildren, and the precepts of the Korán ordaining that forests belong to those things that are free to every man, are against forest conservancy in the Mahomadan portion of the Province.

The reports of several, for forestry, most favourably situated districts do not mention the important subject of arboricultural development by private enterprise. This is to be regretted, but, generally speaking, the interest taken in the question is most satisfactory.

II.—CANAL ARBORICULTURE.

No reports having been received from the Bari Doab Canal, 1st and 2nd Divisions, a generalization of the Provincial work seems useless.

I submit the following forms: an abstract of the progress in arboriculture, as far as I could compile them, as well as a statement showing the income and expenditure.

Progress Statement of Avenues planted in Canal Divisions during the year 1883-84.

	I	II	III	IV	V	VI
Division.	Road or Canal on which avenues have been planted or are in course of construction.	Length of single lines stocked with trees or established plants at the beginning the year.	Length of single lines planted during the year.	Length of single lines on which cultivation has failed or on which trees or established plants have been destroyed or felled.	Length of single lines stocked with trees or established plants at the end of the year.	Species of trees cultivated.
	Total length in feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	
Bari Doab Canal, 1st Division*						
Ditto 2nd Do.*						
Swat River Canal, Do.	541,200	9,760	7,386	1,3 80	15,766	Shisham, mulberry and bakain.
Upper Sutlej, Inundation Canal	1,589,280†	1,589,280	...	...	1,589,280	Mostly kikar.
Chenab Canal Division ...	...	...	...	...	...	...
Lower Sutlej & Chenab Division Inundation Canals ...	...	...	...	...	...	173,906 trees in all in this Division consisting of sissu, kikar, mangoe.
Indus Canal D. G. Khan Division ...	2,395,250	678,050	36,500	20,250	694,300	Sissu, kikar, siris, tun.
Muzaffargarh Division Inundation Canals ...	213,205	145,550	...	22,800	122,750	Shisham, pomegranate, mangoe, tamarisk, pipal, plum, mulberry, kikar, sarin, lasura, and bar.
Sirhind Canal, Main Line Division ...	3,166 acres	970 acres	544 acres	...	1,514 acres	Kikar, shisham, and mangoe.
Do. 3rd Do.	3,010 „	1,442 „	644 „	...	2,086 „	
Do. 4th Do.	2,814 „	342 „	185 „	...	527 „	
Do. 5th Do.	3,868 „	1,075 „	278 „	...	1,353 „	
Western Jumna Canal, Karnal Division ...	1,093,900	1,182,000	...	...	1,182,000	Simbal, pipal, bakain, tut, tun, shisham, mango, khatta, bahera, bar, mahogany, eucalyptus and jaman.
Western Jumna Canal, Hansi Division ...	1,172,582	2,139,590†	...	...	2,139,590	Kikar, shisham, tun, mango, farash and mulberry.
Western Jumna Canal, Delhi Division ...	1,098,633	1,867,794	116,160	...	1,983,954	Shisham, tun, jaman, nim, siris, kikar, gular, mulberry, pipal, mango.
Western Jumna Canal, New Delhi Branch ...	372,580	55,000	...	...	55,000	Sissu, kikar, tun, jaman.
Total... ...	8,476,630	7,667,024	160,046	44,430	7,782,640	

* Reports not received. † There are no regular avenues in this Division, and trees are of spontaneous growth.

Canal Income.

Division.	I.—Ornamental Gardens.							II.—Nurseries.							III.—Avenues and Groves.							IV.—Afforested Wastes.							Grand Total.
	Wood.							Wood.							Wood.							Wood.							
	Lopping.	Thinning.	Dead trees.	Fruit.	Plants.	Grass.	Miscellaneous.	Lopping.	Thinning.	Dead trees.	Fruit.	Plants.	Grass.	Miscellaneous.	Lopping.	Thinning.	Dead trees.	Fruit.	Plants.	Grass.	Miscellaneous.	Lopping.	Thinning.	Dead trees.	Fruit.	Plants.	Grass.	Miscellaneous.	
															Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.							Rs. A. P.
Bari Doab, 1st Division																												
Ditto 2nd Do.																												
Swat River, Canal Division ...																												
Upper Sutlej, Inundation Canal ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,755 0 0	...	...	2,520 0 0	...	...	...	...	...	...	...	...	4,275 0 0
Chenab Canal Division																												
Lower Sutlej and Chenab Division																												
Inundation Canal	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3,299 1 9	...	*5,728 4 6	92 8 0	...	...	2 13 0	...	...	...	...	...	...	...	9,122 11 3
Indus Canal, Dera Ghazi Khan Division.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*5,590 0 3	...	...	...	288 4 0	...	...	...	...	...	...	...	5,878 4 3
Muzaffargarh Division Inundation Canal.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,640 0 0	...	690 10 9	60 0 0	...	...	...	...	...	...	...	...	...	...	2,390 10 9
Sirhind Canal, Main Line ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,564 0 0	2,825 0 0	1 0 0	...	2,726 0 0	...	...	...	...	...	...	...	...	7,116 0 0
Ditto 3rd Division ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3 0 0	...	...	...	615 0 0	...	...	...	...	...	...	...	...	618 0 0
Ditto 4th Ditto ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	245 0 0	...	...	...	82 0 0	...	...	...	...	...	...	...	...	327 0 0
Ditto 5th Ditto ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	153 0 0	210 0 0	1 0 0	...	945 0 0	...	...	...	...	...	...	...	...	1,309 0 0
Western Jumna Canal Karnal Divn.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	713 0 0	788 0 0	...	2,344 0 0	...	...	...	...	...	...	...	...	3,845 0 0
Ditto Hansi Do. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*9,004 0 0	107 0 0	...	...	46 0 0	...	...	...	...	...	...	...	9,157 0 0
Ditto Delhi Do. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*6,392 5 0	1,250 10 0	...	431 8 2	28 0 0	...	...	...	...	...	...	...	8,102 7 2
Ditto New Delhi Branch.																												
Total ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4,939 1 9	1,965 0 0	32,908 4 6	2,300 2 0	...	9,663 8 2	365 1 0	...	...	...	...	...	...	...	52,141 1 5

* Including receipts from the sale of timber.

Canal Expenditure.

Division.	I. Ornamental Gardens.		II. Nurseries.		III. Maintenance and Repairs of Established Avenues and Groves.		IV. Extension of Avenues and Groves.		V Afforestation of Waste Land.		Grand Total.			Surplus.			Deficit.		
	A. Working.	B. Establt.	A. Working.	B. Establt.	A. Working.	B. Establt.	A. Working.	B. Establt.	A. Working.	B. Establt.	Rs.	A.	P.						
Dari Doab, 1st Division ...	...	...	...	...	...	...	...	...	...	...	...	...	...	} Reports not received.			...	...	...
Do. 2nd Do. ...	...	...	...	...	...	...	...	...	...	...	...	...	...						
Swat River, Canal Do. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	Not reported			...	...	...
Upper Sutlej, Inundation canal ...	...	...	...	...	...	...	...	...	...	...	4,271	0	0	4	0	0	...	...	...
Chenab, Canal Division. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lower Sutlej and Chenab Division Inundation canal	...	...	...	...	1,916 15 2	...	...	...	...	...	1,916	15	2	7,205	12	1	...	...	...
Indus Canal, Dera Ghazi Khan Division ...	563 2 6	...	...	...	2,538 3 3	...	...	...	...	...	3,101	5	9	2,776	14	6	...	...	...
Muzaffargarh Division Inundation canals,	...	...	510 9 8	...	...	...	...	...	...	...	510	9	8	1,880	1	1	...	...	...
Sirhind canal, Main line Division ...	...	...	2,345 0 0	...	3,289 0 0	...	...	...	...	...	5,634	0	0	1,482	0	0	...	...	...
Do. 3rd ,, ...	...	...	6,857 0 0	...	3,719 0 0	...	...	...	...	...	10,576	0	0	...	...	...	9,958	0	0
Do. 4th ,, ...	...	...	2,110 0 0	...	7,006 0 0	...	...	...	...	...	9,116	0	0	...	...	...	8,789	0	0
Do. 5th ,, ...	...	...	1,985 0 0	...	6,213 0 0	...	...	...	...	...	8,198	0	0	...	...	...	6,889	0	0
Western Jumna Canal, Karnal Division ...	...	...	386 0 0	384 0 0	...	...	...	...	...	...	770	0	0	3,075	0	0	...	...	...
Do. Hansi ,, ...	...	...	2,796 0 0	...	...	...	...	...	...	...	2,796	0	0	6,361	0	0	...	...	...
Do. Delhi ,, ...	...	...	1,125 13 1	...	...	...	...	...	...	...	1,125	13	1	6,976	10	1	...	...	...
Do. New Delhi Branch ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	563 2 6	...	18,115 6 9	384 0 0	24,682 2 5	...	...	...	...	...	48,015	11	8	29,761	5	9	25,636	0	0
											Net Surplus =			4,125	5	9			

The arboricultural operations on the canals are much easier supervised than the more scattered works comprised in district arboriculture, and the results are generally speaking satisfactory.

However even amongst the canal plantations, last year's long drought and dry hot wind did damage, especially amongst the young mangoe groves in the Delhi and Rohtak canals.

I beg to draw attention that the Executive Engineers of Hansi, Karnal Division, and Indus Inundation Canals complain about cattle trespass and broken fences. This is especially to be regretted in Hansi where the bamboos have seeded. From the Indus Inundation canals it is reported that even men of good position, such as Zaildars, permit their cattle to trespass. From the Lower Sutlej canals it is reported that kikar trees growing on the canals are lopped by the zamindars, a custom which ought to be stopped.

The Superintending Engineer, Western Jamna canals, and Executive Engineer of Hansi, again report that the monkeys entirely prevent the reproduction of the once most magnificent belts of trees on the Hansi canal. Surely fine avenues of trees are more valuable and useful than herds of monkeys, which I think should be exterminated.

III.—ARBORICULTURE ON PROVINCIAL ROADS.

The statements have been sent in the prescribed form, unaccompanied however by any notes or remarks. The following is an abstract statement showing the progress made in arboricultural operations during the year, exhibiting a decrease in the length of single line of avenues of 214,348 feet. In the absence of more detailed information I am unable to explain this decrease.

Progress Statement of Avenues planted on Provincial Roads during the years 1883-84.

Divisions.	I	II	III	IV	V	VI	VII
	Road or canal on which avenues have been planted or are in course of construction.	Length of single lines stocked with trees or established plants at the beginning of the year.	Length of single lines planted during the year.	Length of single lines in which cultivation has failed or on which trees or established plants have been destroyed or felled.	Length of single lines stocked with trees or established plants at the end of the year.	Species of trees cultivated.	Remarks.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*		
Peshawar Division	1,929,060	420,255	26,900	7,800	439,355	Shisham, mulberry, kikar, bakain, tamarix, siris, willow, ber, acacia.	
Rawalpindi ,,	945,120	348,480	...	...	348,480	Kikar, shisham.	
Lahore ,,	1,622,832	2,620,407	340,535	175,202	2,785,740	Shisham, siris, kikar mulberry, farash, beri, jhund, tut, pipal, naseya, bohar, jaman, mangoe.	
Amritsar ,,	636,388	1,708,886	41,957	490,686	1,260,157	Shisham, kikar, siris, mangoe, jaman, phowan, phulai, bakain, kachnar, lasura, tun, mulberry.	

Progress Statement of Avenues planted &c.—Concluded.

Divisions.	I Road or canal on which avenues have been planted or are in course of construction. *Feet.*	II Length of single lines stocked with trees or established plants at the beginning of the year. *Feet.*	III Length of single lines planted during the year. *Feet.*	IV Length of single lines in which cultivation has failed or on which trees or established plants have been destroyed or felled. *Feet.*	V Length of single lines stocked with trees or established plants at the end of the year. *Feet.*	VI Species of trees cultivated.	VII Remarks.
Umballa Division	...	...	...	...	...	...	
Delhi „	1,232,880	1,368,200	37,170	16,550	1,388,820	Shisham, jaman, nim, siris, kikar, mangoes, pipal, mulberry.	
Simla „	...	...	...	...	...	...	
Derajat „	1,374,091	322,841	54,930	23,074	354,697	Siris, kikar, farash, shisham, bakain, bhani, mangoe, mulberry, willow.	
Jullundur „	485,869	432,379	38,360	10,888	459,851	Shisham, sambhal, mulberry, nim, pipal, amaltas, siris, mangoe, tun, ooi, urjan, tut, kanyar, dhoora, and drek.	
Total ...	8,226,240	7,221,448	539,852	724,200	7,037,100		

No financial statements have been submitted by Executive Engineers Provincial Roads.

I have &c.,

BERTH RIBBENTROP,
Offg. Conservator of Forests, Punjab.

I.—DISTRICT ARBORICULTURE.

DELHI DIVISION.

Remarks by Commissioner.

Delhi.—The report is a full one and describes the operations of the year in great detail, but the results, as regards the planting out of fresh trees, is *nil*. Owing to the scanty rainfall, all the efforts of the establishments were devoted to the preservation of the existing avenues and groves, and were so far successful, but, with an expenditure of Rs. 6,175 during the year, which is the highest of the three districts of this Division, tree planting operations might have been undertaken, to a moderate extent at any rate, and in the most favoured localities, for it is seen that, in Gurgaon and Karnal, this *was* done, and with better success than was to have been expected from the prevailing drought.

Karnal.—The Karnal report,—a very meagre one, consisting almost entirely of figures,—shows that the result for the year was rather disastrous—2,261 trees having died, while only 945 new ones were planted out: to a certain extent, this was to have been expected, owing to the scanty rain-fall of the year, but, considering that upwards of Rs. 5,000 was expended on establishment and maintenance charges, of which Rs. 2,388 was for pay of bhistees, so many trees should not have been allowed to die for want of water.

Gurgaon.—In Gurgaon, which has suffered very severely from drought, it may safely be said more severely than any other district in the province, evil results were perforce to have been expected in the preservation of the trees, especially those planted out in the more arid portions of the district, but, from the figures given in the report, it appears that the comparatively small number of 3,746 existing trees died, while 9,939 new ones were planted out and 16,564 transplanted, a result which may safely be said to be very satisfactory taking climatic and local circumstances into consideration. The establishment for watering cost Rs. 2,711, or very little more than that in Karnal.

During a recent visit to Gurgaon, the officiating Commissioner had an opportunity of noticing the avenues and groves of trees about and in proximity to the Saddar station, and they were all in a good and flourishing condition.

1.—DELHI DISTRICT.

General remarks.—The year was extremely unfavourable for tree planting. The rains set in well in July, but ceased suddenly after a few showers and were followed by scorching hot winds, which more or less prevailed throughout the entire hot season. In consequence no seed was sown in trenches on the road-sides in the dry parts of the district, especially in the Ballabgarh tahsil, and wherever it was sown the results were very unsatisfactory. Many seedlings and young trees were also destroyed by white ants, and thrown down by heavy storms, which further injured the young plants by burying them under sand drifting from the road-sides into the trenches.

Delhi Municipality.—An account of arboricultural operations within Delhi Municipal limits has been supplied by the Secretary Municipal Committee, and a copy of his report is annexed.

Operations of the year.—Roads.—As regards the district roads the operations consisted in tending the trees planted on the following roads—

Sonipat-Bahalgarh road	...	...	(4 miles).
Sonipat-Murthal road	...	...	1 „
Delhi-Najafgarh road	...	...	4 „
Badarpur-Tughlukabad road	...	...	3 „
Humayun-Sufdurjung Tomb road		...	2½ „

The trees on these roads were regularly watered morning and evening by water carriers, blanks were filled and withered up trees were replaced. Seed was also sown on these roads in the blank spaces between the trees. These avenues are progressing very favourably. Young trees on some of these roads were also covered with munj-grass in the cold season to protect them from frost. Trees planted on the circular road round the town of Sonipat in previous years are also doing well under the supervision of the Sonipat Municipal Committee.

Kikar seed was sown on the following roads in trenches in the manner described in previous year's report:—

Sarsauli-Sonipat road (10,560 feet on each side), in patches in existing avenue.
Jhundpur-Bahalgarh road (10,560 feet on each side), in continuation.
Azadpur-Bhaghpat road (10,560 feet on each side), in continuation.
Paik-ka-Makbara-Bowáná road (89,760 feet on each side), sown again on the whole line of road.

The seeds germinated on all these roads, but owing to want of rain the seedlings on the Azadpur-Baghput and Paik-ka-Makbara-Bowana roads were all destroyed. A few, however, survived on the first two roads. As the cost of sowing seeds in trenches amounted to about Rs. 160 for the whole district, this failure is not in a financial point of view so very serious.

Groves and trees at Police buildings.—Owing to the severe drought arboricultural operations at Police stations were also confined to the maintenance of the existing groves and trees at Police stations, Rest-houses, and Road-posts. The following extracts from a report furnished by the District Superintendent of Police shew the progress made in tree-planting at these places.

Description of work.—The past year was a most unfavorable one as regards arboriculture, and in consequence of the severe drought many trees died. As, however, there are nurseries at Rai, Faridabad, and Chhansa, these trees will be replaced this year as soon as the rains have properly set in.

Very little planting was done last year, as the season was not favorable for planting trees. 76 trees were, however, planted at Majhaoli, 72 of which are at present alive. The percentage of trees planted successfully is accordingly 94.

Establishment and supervision.—Four malies and eight bhisties are employed to look after and water the trees at the various Police-stations and posts, and a supervision is exercised over them by the officers in charge of the various Police-stations.

Cart enclosures.—Kikar seed was sown in a trench round the Cart enclosure at Sonipat. The seed germinated, but the seedlings dried up for want of water.

Delhi Ridge.—One of the most important operations of the year was the attempt to plant trees on the Delhi Ridge, the bare exposed boulders of which have much to do with causing the great heat at Delhi in the hot season. Kikar seed was sown on it but without any result owing to defective rainfall. The ravages of white ants have proved very destructive to this species of trees on the Ridge. The nim tree seems to succeed better.

Nurseries.—There are nine nurseries in this district as shown in the statement. They are all well stocked with young trees. During the year 500 trees were taken for the Delhi Municipality, 500 for the Sonipat tahsil roads, 100 for the Ballabgarh tahsil roads, and about 200 for the Delhi-Najafgarh road, out of the Mubarik Bagh nursery.

Irrigation Bands.—No trees were planted on the Irrigation Bands, as most of them have been only recently constructed.

Eucalyptus trees.—The Eucalyptus plants growing in the Kudsia, Roshnárá, and Queen's Gardens are doing well. The following brief account of the progress made by them during the year under report has been furnished by the Secretary Municipal Committee, Delhi.

In the Roshnárá gardens the trees continue to give satisfaction. Out of the thirty-three trees reported on last year one has since died from being damaged by a wild pig; the remainder are doing well. In the Kudsia gardens there are 23 trees about six feet high and about 17 plants in pots varying in height from 6 inches to 1 foot. These trees would not appear to thrive as favorably as those planted in the Roshnárá gardens. They have a stunted appearance, which is attributed by the Honorary Secretary to an insufficient supply of canal water to the Kudsia gardens in the last year. There are 33 Eucalyptus trees in the Queen's garden, including plants in pots. Out of these only three have attained a height of 20 feet, the others are still very small, but will improve in time.

Scheme for the encouragement of tree-planting by zamindars.—The rules drawn up by Mr. Maconachie last year were extensively circulated among the zamindars, and considerable preparations were made in some parts for sowing plots under the hope of rewards held out. But the very short rainfall gave an excuse to the lazy, and a substantial reason to the really energetic, for not doing much, and the result at present must be reported as little or nothing. Yet it by no means follows that the people will not plant and sow trees. It is something to have drawn attention to the matter. Attempts will again be made to urge the zamindárs to action in the rains this year, and if, as seems generally expected, the rainfall proves timely and copious, no doubt a start will be made. Slowly, year by year, if the District Committee do not lose sight of the matter, the idea will gain ground, and there is every reason to hope it will eventually become popular.

Subsidiary plan for encouraging tree-planting.—Meanwhile a subsidiary plan has been adopted which is also promising. Plots of land here and there in selected spots have been taken up by the Committee for systematic planting. In the hill village of Assunla, where the fertile red soil is Government property, two large plots aggregating over 50 bigahs have been enclosed with an earthen wall and ditch, and an adjacent tank dug for a supply of water. In Mahrauli, Gumanherá, Dhindásá, and Suraedah, the zamindárs have made over plots of land of considerable size to the Committee on the following conditions :—A tank to

be dug by the Committee, the land to be enclosed and guarded and planted at the expense of the Committee, the property in the soil to remain with the zamindars, who, whenever the Committee choose to cut the trees, will receive half the value. This arrangement has been intelligently accepted by these villages, and large plots of land will it is hoped be sown and planted in the rainy season now approaching. We shall have quite enough to do to occupy fully the land thus obtained, but when we want more there is no doubt we can get it. Tanks at these places are in active progress.

Lopping, weeding and transplanting trees.—Branches of trees which are occasionally found to be overhanging the roads or to interfere with the development of the trees, are lopped carefully with hand-saws in June, July, and February-March, by the malis.

The young trees are weeded by slightly turning up the earth with a spade, and removing the grass growing round their roots.

Whenever young trees are required for transplantation the earth is first dug away round them carefully as deep as the roots of the plants, and they are taken out with a thick layer of earth around them and carried to the roads where they are to be planted.

Establishment.—The establishment employed during the year on the various roads and plantations, consisted of malis, bhistees, jamadars, foresters, and pakhalis, and cost Rs 6,174-13-10 as follows :—

	Rs.	A.	P.
District Funds	2,028	15	7
Delhi Municipality	3,878	0	0
Sonipat do.	223	14	3
Ballabgarh do.	44	0	0
	6,174	13	10

The Tahsildars assisted by the sub-overseers supervise the arboricultural operations within their tahsils, and their work is inspected by the District officers during their tours of inspection.

The financial result were as follows :—

	Rs.	A.	P.
Income	4,961	7	3
Expenditure	7,624	8	1
Deficit	2,663	0	10

Delhi Municipality.

General remarks.—There is nothing of any importance that would call for remark under this head, beyond stating that owing to a scanty fall of rain many of the trees that had been planted during the year died, and others somewhat affected from a want of rain. As a matter of fact greater attention is paid to planting operations before the commencement of the rainy season in anticipation of the benefits that the young plants will derive therefrom.

Description of work.—There were no new roads that required planting during the year. The work consisted of filling gaps, replacing withered-up trees, and extending planting on such roads as needed the same. The following is a detail of the work done.

Civil lines.—The avenue recently laid out in the Civil lines and referred to in para 3 of my report for the previous year has quite fulfilled the expectations entertained at that time. The trees have made rapid progress, with the exception of some few that were destroyed by cattle. To protect those that were standing it was found necessary to raise the *jaffri* enclosures from three to six feet. When these trees have attained their average height after a few years, the whole length of the road will form a very pretty avenue.

Very little remains to be done in respect to the other roads in Civil lines. Every road may be said to be complete with its avenue of trees uniformly arranged. Occasionally when a tree either dies or is blown down in a storm, it is removed and a new one planted in its stead.

An establishment consisting of malies and bhistees are permanently employed by the Committee to attend to this work in the Civil lines.

The following roads were supplied with new plants :—

Flag-staff tower road	200
Alipur road	51
The Park	60
Rajpur road	17
The Ridge	47
Cabul Gate entrance	13

Tree planting was extended on the Flag staff tower road. The plants have been provided with protectors and these have been constructed of bricks to save the plants from being destroyed by cattle grazing on the Ridge.

The young trees planted on the portion of the Alipur road that passes through old cantonments have made fair progress and in time satisfactory results may be expected. Certain parts of the Alipur road from Ludlow Castle to the Rajpur junction are incomplete, but during the current season steps will be taken to fill up open spaces existing at present with suitable plants. There is some difficulty in procuring water for the plants in this direction, and consequently they do not thrive so well.

The trees planted along the well of the Park are doing well. They consist of nearly all shisham; the same may be said of the large number planted within these grounds.

Some years ago the Committee obtained a large number of mangoe trees from the public gardens at Saharanpur and planted them on an available plot of ground in the Civil lines, with the object that in the space of time they would form a pleasant shady grove, but the experiment has not been a success.

Most of the plants have failed, and the few that now remain do not seem to make much progress, notwithstanding that great care and attention have been bestowed on them. It would appear therefore that the nature of the soil in this particular locality is not suitable to the production of mangoe plants, although no difficulty has been found in raising the same in other places, such as in the several public gardens under the control of the Municipality.

The Rajpore road avenue was completed in the previons year, and the trees are doing well. The enclosures having been destroyed by white-ants had to be renewed.

The Ridge.—During the year the Commissioner of the Division addressed the Municipal Committee, suggesting the desirability of adopting measures to plant the Ridge with trees in order to cover the bare rocks with foliage to diminish the heat and radiation from its surface. The proposal was at once adopted, and the arrangement for carrying out the work has been entrusted to an experienced officer. A full and detailed account of the progress made will be embodied in the arboriculture report for next year, as at present there is nothing to report, the work having just begun.

The Roshnárá lane road from the Grand Trunk road to the top of the Ridge was replenished with trees, and a few more are now only wanting to complete this avenue.

Thirteen trees were planted on both sides of the entrance to the Cabul Gate, and are making fair progress.

Planting in City.—The roads in the city are almost all complete in respect to tree planting. The following roads were supplied with plants during the year :—

Lothian road	10
New road opposite College	5
Near Cashmir Gate	22
Hamilton road	32
Kutcheri road.	4
Mori Gate road	9
Esplanade road	16

Circular road.—The avenue round the circular road from the Cashmir to the Delhi gate has been completed year after year. There were 58 new trees planted on this road and 85 on the Kutub road between Jai-Singhpura and Khirki farashkhana.

Planting in suburbs.—The roads in the suburbs have also been well attended to, and the avenues with few exceptions are almost perfect. A detailed list of roads showing the number of trees planted is given in the usual statement which will be found attached to this report.

The double row of trees planted by Lalla Budri Dass on the kutcha road from the old Idgah serai to the Hindu temple at Jhandáwála well, have within the past three years made excellent progress. Out of the 430 trees planted few have perished. This person has already expended a large amount towards purchasing plants and for providing the same with proper tree protectors.

The establishment employed for attending to the trees is maintained at his own personal expense, and consists of two malies and several bhistees. The trees have attained a height of twenty feet and are in a flourishing state.

Annual expenses.—The sum expended by the Committee towards the maintenance of trees amounted to Rs. 4,189-9-11 against Rs 4,161-3-11 in the previons year, as per details given below :—

	Rs.	A.	P.
Salary of establishment	3,350	0	0
Planting on the Ridge	100	0	0
Repairs to enclosures &c.	739	9	11
Total Rs. ...	4,189	9	11

Bela plantation.—The income derived from the Bela plantation during the past year amounted to Rs. 3,870-0-6 against Rs. 3,443-12-6 in the preceding year. The expenditure amounted to Rs. 665-3-4. Details of both income and expenditure are appended.

INCOME.

	Rs.	A.	P.
Sale of old trees	1,189	0	0
Grazing fees	2,681	0	6
Total Rs.	3,870	0	6

EXPENDITURE.

	Rs.	A.	P.
Pay of Establishment	528	0	0
Contingencies &c., ...	137	3	4
Total Rs.	665	3	4

The work of clearing away the undergrowth, consisting of *jhow* and tall grass which had again sprung up, is now in progress and the work will be completed in the course of a few more days. The sanitary state of the plantation has been satisfactory throughout the past year.

Lopping.—Lopping operations have been successfully performed under the supervision of ward members.

GURGAON DISTRICT.

General remarks.—The plan of operations proposed last year has been followed, and planting carried on to complete the avenues along the roads from—

Palwal to Sohna, Núh and Hatin;
Firozpur to Alwar and Núh;
Rewári to Jhajjar;
Núh to Sohna, Rewári and Firozpur; and
Gurgáon to Bahadargarh and Dehli.

The rainfall was below the average, and the long continued break in the rains during July and August, destroyed the broadcast sowings of kikar, and numbers of new trees which were not sufficiently established to endure a drought following so soon after transplanting.

The practice here in making kikar sowings is to plough after a good fall of rain a strip of land 4 or 5 feet wide along the boundary of a road, and having sown the seed broadcast to pass a clod-crusher over the strip.

The kikar sowings done on this plan in former years are showing well, and promise to prove very successful.

A scheme for a system of conservancy on the bare ranges of hills through the joint efforts of the people and the Local Boards, is being prepared, and will be tried in the ensuing season for planting operations.

As the greatest difficulty has hitherto been found in keeping alive new plantings during the scorching dry winds of May and June, the watering establishment was during this year increased so as to admit of the plants being watered more frequently, the results of which have been very satisfactory.

The plan suggested by the Conservator of Forests of burying *gharras* near roots of plants to act as reservoirs of water will also be adopted. The spring level in most parts of this district is not very deep, and plants make rapid growth when once the roots have taken, which is usually two or three years after planting *in situ*.

Though the zamindars of this district are fully alive to the benefits of planting trees round wells and forming groves on road-sides, fruit tree planting is at present entirely neglected by them; and, although there is no doubt that the climate and soil of this district in most parts, especially in the Palwal tahsil with canal irrigation, is very suitable for fruit tree planting, such as mangoe, jáman, shahtoot, and ber, yet, within the last few years, there has hardly been an instance of the planting of a private orchard.

The protection of plantings on road-sides from damage by cattle has received special attention, and it is found that a thorn fence four feet high is the best and cheapest method. The thorn fence when properly made, effectually prevents sheep and goats from doing damage, and moreover screens the plant from intense heat and cold; but it is liable to be blown away during storms, and requires frequent attention.

The malis trained last year were again employed in lopping and thinning out trees along road avenues during December and January, and the work while in progress was frequently inspected by the District Engineer, as the men require unceasing supervision to keep them up to their work.

Description of work.—The following is a record of work done :—

Tahsil.	Name of road.	No. of trees at the beginning of the year.	Trees planted.	Successful out of those planted during the year	Percentage successful.
Gurgaon ...	Gurgáon-Firozpur, Gurgáon-Sohna ...	17,173	1,528	1,342	
	Sohna-Núh	800	398	283	
	Gurgáon Section	17,973	1,926	1,625	84
	Basái road	525	850	560	61
	Bahadargarh	5,240	850	610	72
	Kutab road	3,350	500	345	69
Nuh ...	Gurgáon-Firozpur (Núh section)	2,925	177	74	42
	Núh-Rewári	2,273	220	110	50
	Bahora-Táoru (Núh section)	1,345	2,985	1,757	59
	Hatin Palwal	1,649	1,765	891	50
Palwal ...	Sohna Palwal (Palwal section)	2,350	1,530	1,230	80
	Pawal-Núh	1,000	450	350	78
	Pawal-Hatin	950	1,000	800	80
Firozpur ...	Gurgáon-Firozpur, Firozpur-Nuh	1,836	425	425	100
	Firozpur-Alwar	1,024	100	100	100
Rewári ...	Rewári-Jhajjar road	423	1,350	1,340	99
	Grand Total	42,863	14,128	10,217	72

	Name or locality of nursery or groves.	No. of trees on 31st March 1883.	Planted during 1883-84.	Total.	Died or trans-planted.	Remaining.	Remarks.
	Tahsil Gurgaon.						
	Civil Station grove	2,780	220	3,000	*2,900	100	*All planted out on roads.
	Jharsa Bund avenue	570	...	570	...	570	
1	Bhundsi R. H. nursery	581	191	772	...	772	
	F. Nagar Ry station	267	300	567	200	367	
	Station garden ,, ...	1,900	...	1,900	1,300	600	400 planted out on roads.
2	Sohna nursery	1,247	...	1,247	47	1,200	
3	Do. do. (new)	...	1,718	1,718	...	1,718	
4	Sohna Palwal (new)	...	500	500	...	500	
5	Sohna Nuh (new)	...	160	160	...	160	
	Total ...	7,345	3,089	10,434	4,447	5,987	
	Tahsil Rewari.						
6	Rewari Jhajjar nursery	150	...	150	90	60	
	Total ...	150	...	150	90	60	
	Tahsil Palwal.						
	Sohna Palwal road Mile No. II ...	400	...	400	50	350	
	Do. do. Mile No. V	100	...	100	50	50	
7	Palwal tahsil nursery	599	300	899	562	337	500 planted out on roads.
8	Palwal Hatin ,, ...	709	...	700	300	400	
9	Palwal Nuh ,, ...	50	...	50	50	...	
10	Palwal Solrah ,, ...	3,300	5,000	8,300	3,200	5,100	2,500 do. do.
	Total ...	5,149	5,300	10,449	4,212	6,237	
	Tahsil Nuh.						
11	Taoru nursery	11,276	...	11,276	10,301	975	6,639 do. do.
12	Nuh ,, ...	897	...	897	572	325	
	Total ...	12,173	...	12,173	10,873	1,300	
	Tahsil Ferozpur.						
13	Bhadas nursery	642	...	642	338	304	325 do. do.
	Committee House	2,100	1,550	3,650	*350	3,300	*All planted out on roads.
	Total ...	2,742	1,550	4,292	688	3,604	
	Grand Total ...	27,559	9,939	37,498	20,310	17,188	

Wells were sunk or deepened on—

Sohna road	1 well made. 6 wells cleaned.
Sohna-Palwal	5 wells made.
Palwal-Nuh	1 well made.
Basai road	2 wells made.
Bahadargarh	3 wells made. 2 „ cleaned.
Farakhnagar Ry. station road	3 wells made.

Establishment and supervision.—The following establishment has been kept up.

Gurgaon tahsil.	*Malis.*	Rs.	*Bhishtis*	Rs.	
Gurgáon-Firozpur road to Sohna ...	3 at	4 ...	6 at	4	
„ Sohna-Nuh road ...	1 „	4 ...	3 „	4	
Gurgáon Ry. station road	1 „	4 ...	2 „	5	
Bahadargarh „	2 „	4 ...	3 „	5	
Kutab road	2 „	4 ...	1 „	5 & 2 @ Rs. 7	
Sohna-Palwal road	2 „	4 ...	3 „	4	
Bahora-Taoru road	1 „	4 ...	1 „	4	
Basai road	1 „	4 ...	2 „	5	
Faraknagar Ry. station road	1 „	4 ...	2 „	5	
Civil station roads	2 „	4 ...	2 „	5	
Bhundsi nursery	1 „	5			
Sohna „	2 „	4			

and one Darogah @ Rs. 12 per mensem.

Tahsil Nuh.	*Malis.*	Rs.	*Bhishtis.*	Rs.	
Núh-Firozpur part of Gurgaon-Firozpur road		...	1 at	6	
Núh-Rewári		...	1 „	6	
Silkhoh-Taoru part of Núh-Rewári road		...	1 „	4 & 1 @ Rs. 6	
Hatin-Pawal road	1 at	4 ...	2 „	6	
Taoru-Bahora	1 „	4 ...	3 „	6	
Taoru nursery	1 „	5			
Núh „	1 „	4			
Núh „ (Rest-house)	1 „	5			

Palwal tahsil.					
Palwal-Sohna	3 at	4 ...	1 at	7 & 3 @ Rs. 4	
Palwal-Núh	1 „	4 ...	1 „	4	
Palwal-Hatin	1 „	4 ...	2 „	4	
Palwal nursery	1 „	2-8 moiety, watering by las	4		
Palwal-Solrah road nursery	1 „	4 ...	...		

Firozpur tahsil.				
Firozpur-Alwar road	2 at	4 ...	1 at	7
Firozpur nursery	1 „	4 ...	1 „	4
Bhadas „	1 „	5 ...	...	

Rewári tahsil.				
Rewári Jhajjar road	1 at	4 ...	2 at	7
Circular road to Ry. station	3 „	4 & 1 @ Rs. 5	4 „	7
Dharuhera road	1 „	4	...	

The watering establishment is not regularly kept up. As soon as the rains break the bhishtis are discharged, and re-appointed when the climate necessitates the watering of plants. This year, owing to the failure of the rains, the services of the bhishtis could not be dispensed with for a very long period. In the winter months also a considerable reduction is made, as waterings are given after longer intervals.

Financial results.—The following memo. gives detail of receipts and expenditure on arboriculture during 1883-84:—

Receipts.

	Rs.	A.	P.			
From sale of trees	714	2	6			
„ grass and pulás	111	7	0			
				825	9	6
Total ...						

Expenditure.	Rs.	A.	P.
Pay of malis	1,938	3	10
„ of bhishtis	2,710	8	11
Carriage of plants	79	10	0

Making of "Thaolas"	3	4	0
Purchase and repair of implements	10	9	3
Digging and clearing of wells	51	4	0
Protection of trees	77	4	0
Pay of Darogha...	178	10	8
Huts for malis	13	8	0
Charges for canal water	13	5	4
Rent of land taken up for nursery grounds ...	1	13	0
Lopping of trees	8	5	0
Manuring	2	8	0
			5,088 13 0
... Deficit	Rs.		4,263 3 6

3.—KARNAL DISTRICT.

General remarks.—Rainfall.—The year was very unfavourable for tree planting as the rainfall was 17·5 in the Karnal, 14·7 in the Panipat, and 7·1 in the Kaithal tahsils, as compared with 22·2, 22·7, and 17·5 respectively of the average of the last five years.

Description of work.—The following tabular statements A. and B. show the description of work done during the year:—

A.—Plantation on roads.

Name of Road.	New work.	Number of trees died.	Number of blanks filled up.	No. of trees maintained including those planted during the year.	Amount expended on maintenance. Rs.	A.	P.
Karnal and Kaithal road	304	605	605	1,801	949	2	6
,, and Saharanpur road	...	24	24	112	69	0	0
,, and Hansi road	527	...	...	810	156	0	0
Civil Station roads	24	592	592	1,956	981	7	9
Karnal and Ferozepur road	...	340	340	876	536	8	3
Road from Kothi Panipat to Rer Escape ...	...	...	...	550	220	7	6
Road from G. T. Road to Kothi Panipat ...	...	...	...	540	141	6	0
Panipat and Sanauli	...	700	...	1,050	632	7	3
Chhajpur and Sewa road	...	...	...	2,342	521	5	10
Kaithal and Deobund road	...	...	...	910	513	0	9
Rajaundh and Asandh road	...	...	...	401	137	8	8
Kaithal and Pehowa road	68	...	...	134	50	2	7
Pundri Rest-house	22	...	...	122	48	0	0
Total Rupees ...	945	2,261	1,561	11,604	4,937	3	1

B.—Groves and Nurseries.

Name of groves &c.	Total length on area in acres.			Total number of trees as stood on the 1st April 1883.	Operations of the year. New work.	No. of trees died.	Blanks filled up.	Blanks left.	Total number of trees as stood on 1st April 1884.	Remarks.
Karnal.										
1 Nursery at Karnal	7	2	0	3,202	...	...	...	...	2,625	
1 Grove at Gharanda	3	2	0	21	...	...	...	...	21	
1 Encamping ground Karnal	44	2	10	620	...	10	...	10	610	
1 Do. at Gharanda	62	2	0	127	...	2	...	2	125	
1 Do. at Butana	62	1	15	376	...	3	...	3	373	
1 Thana compound Bazar and Tank Butana	4	1	0	65	...	2	...	2	63	
1 Dak Bungalow, Karnal	3	0	20	28	...	...	...	...	28	
1 Police Lines	5	3	30	122	...	...	...	...	122	
1 Katcheri compound	10	0	0	135	...	...	...	...	135	
Panipat.										
1 Nursery, Panipat	0	3	30	4,000	...	...	...	...	4,000	
1 Encamping ground, Panipat ...	63	3	0	53	...	...	...	...	53	
1 Do. Sambalka	44	0	10	150	...	...	...	...	150	
Kaithal.										
1 Bedhkidar Tank Channel	4	0	0	65	...	3	...	3	62	
1 Nursery, Kaithal	* ...	...	...	2,760	...	...	...	...	1,944	
1 Pundri Rest-house compound ...	3	1	5	100	22	...	...	...	122	
Total ...	319	3	0	...	22	20	...	20	...	

* The land belongs to a private person, hence no measurement is given.

5. *Establishment and supervision.*—The following establishment was maintained :—

		Rs.
8	Mates at various rates	361
9	Malis @ Rs. 5 each	384
9	Pakhalies @ Rs. 8 each	606
65	Bhistis @ Rs. 4	2,388
	Nurseries.	
1	Mali @ Rs. 7	84
7	„ @ Rs. 5 each	419
	Grand Total Rs. ...	2,242

6. *Financial result.*—The following statement gives a detail of income and expenditure, showing a deficit of Rs. 5,616 as against Rs. 5,625 of the preceding year :—

Receipts.	Amount.				Charges.	Amount.		
	Rs.	A.	P.		Established Roadside Avenues.	Rs.	A.	P.
Sale proceeds of trees	58	0	0	8	Mates @ various rates	360	13	2
Sale proceeds of fruits of Station garden vegetables	55	0	0	9	Malis @ Rs. 5 each	383	8	0
				9	Pakhalies @ Rs. 8	605	8	5
				65	Bhistis @ Rs. 4	2,388	5	4
					Planting trees	380	1	1
				4583	Repairs to fences	770	12	4
					Miscellaneous charges	48	2	9
					Total Rs. ...	4,937	3	1
					Nurseries.			
				1	Mali @ Rs. 7	84	0	0
				7	„ @ Rs. 5	419	2	8
					Miscellaneous charges	168	8	10
					Subscription to Agri-Horticultural Society	120	0	0
					Total ...	791	11	6
Total Receipts ...	113	0	0		Grand Total ...	5,728	14	7
					Deficit ...	5,615	14	7

HISSAR DIVISION.

Remarks by Commissioner.

Hissar.—Instructions were issued from this office for the extension of arboriculture in the district, more especially in the Fattahabad and Barwala tahsils along the Ghaggar and Choya valleys, including a scheme for purchase of such suitable tracts of ground as were for sale. As yet this scheme has not made much progress.

The operations during the year were, owing in great part to the nature of the season, confined to the preservation of existing trees, and to such extensions as could be made in the public gardens irrigated from the canal.

In his report the Deputy Commissioner of Hissar has alluded to the formation of an avenue in Hansi, extending from the town to the district rest-house. In a place like Hansi, where the ground is low and water from the canal plentiful, extensive plantations can easily be made. In Hissar also, with irrigation from the canal, much more can be done than has yet been attempted.

By referring to the statements submitted by the Deputy Commissioner, I find that the avenue at Hansi alluded to by him, is nowhere shewn. Indeed, as far as the returns show, the avenues, groves, nurseries, &c., remained at the end of the year in the same condition in which they were at the beginning; not a single tree seems to have been planted, and not a single one was destroyed or felled.

On the 5th of June, in a letter (No. 188) addressed to the Deputy Commissioner, the Commissioner made the following remarks :—

"It is stated in your report that the real extent of existing avenues (and groves, &c.,) has now been recorded with tolerable accuracy, and that a 'correct opening balance' has now been secured. Turning to the Statement, Part I. (progress of avenues), I find that in column II. each item recorded represents either one statute mile exactly, or an exact multiple or fraction of a mile.

"I beg to invite your attention to this; and if there has been any mistake or omission, request that it may be rectified or supplied. Of course it is possible that all the avenues in the district are at this moment of a length which is either an exact multiple or even fraction of a mile; but I think you will agree with me that this would be a very remarkable coincidence, and that the strong probabilities are otherwise. You will observe that some exactness is looked for, as the prescribed Statement is in feet; but it would be entirely satisfactory if measurements were correct within even 20 or 30 yards; and such a rough result could easily be obtained by *pacing* the lengths of avenue.

"I also request the favor of your giving me, as near as possible, the details of the charges (Rs. 3,314) in the following forms :—

A. *In Sudder Station*—Garden, roads.
B. *Out of Sudder Station;*

And by your furnishing a list of the establishment entertained."

No reply has yet been received from the Deputy Commissioner.

The financial results are :—

	Income.	Expenditure.	Surplus.	Deficit.
1. Ornamental Gardens	249	1,488	...	1,239
2. Nurseries	25	804	...	779
3. Avenues and groves...	41	1,022	...	981
4. Afforested wastes ... ... —	...	...	...	...
Total ...	315	3,314	...	2,999

Rohtak.—The year was probably even more unfavourable in the Rohtak district than in Hissar, notwithstanding this a good deal appears to have been done during the year. On six roads new trees were planted; and dead and dry trees were replaced with the following results :—

Tahsil.	*Planted.*	*Died.*
Rohtak	950	... 167
Jhajjar	983	... 339
Gohana	2,355	... 633
Sampla	872	... 240
Total ...	5,160	... 1,379

B Notwithstanding that the rains had almost failed, a very fair amount of work was done. ut the losses also have been considerable. The matter of arboriculture evidently receives special attention in Rohtak, as the Commissioner observed when on tour. The "nim" tree especially is found by Mr. Steel to flourish, and seems to be the tree next to the "kikar" which may most easily be reared. There are some very fine ones in Jhajjar.

The financial results are :—

	Income.	Expenditure.	Surplus.	Deficit.
1. Ornamental Gardens	...	...	...	...
2. Nurseries	...	673	...	673
3. Avenues and groves...	222	6,106	...	5,884
4. Afforested wastes	...	...	...	...
Total ...	222	6,779	...	6,557

These results look hopeless enough ; but all over the country we are in the initial stage of district arboriculture, which has in few districts received sufficient attention ; and we must look to have heavy expenditure with but small returns for some time to come.

Sirsa.—The season in Sirsa was also unfavorable. Shisham, nim, kikar, and pipal were the trees planted on the avenues, groves &c. In the nurseries there were at the beginning of the year 11,948 trees ; planted during the year 3,100 ; total 15,048 ; destroyed, felled, or distributed 3,059. At end of year 11,989.

In the gardens and groves there were at the beginning of the year 7,475 ; planted during the year 387 ; total 7,862. Destroyed or felled 716 ; at end of the year 7,146.

These results also appear very feeble ; but they are partly due to the unfavorable nature of the season.

The great fact in the arboriculture of Sirsa during the past year was the purchase of an area of 423 acres 1 rood 5 poles in mouza Keruwala, tahsil Fazilka, for Rs. 3,450, under the sanction of Government, to be used as an experimental tree plantation. This area will be irrigated from the Mobarikwah, one of the three Inundation canals designed and constructed by Colonel Grey. It adjoins the Municipal rakh at Fazilka, which also is proposed to be planted with trees. The Deputy Commissioner of Sirsa has been called upon to submit a plan of operations for the treatment of this reserve.

The financial results are :—

	Income.	Expenditure.	Surplus.	Deficit.
1. Ornamental Gardens	394	1019	...	625.
2. Nurseries	25	336	...	311
3. Avenues and groves	112	285	...	173
4. Afforested wastes	...	3,450	...	3,450
Total ...	531	5,090	...	4,559

In para 7 of his report Mr. Maconachie has recorded some remarks in which the Commissioner fully concurs, regarding the manner in which arboricultural operations should be carried on in Sirsa ; and when the district is broken up, as it shortly will be, those remarks should be borne in mind by the officers who will take charge of the sub-divisions of Sirsa and Fazilka.

Attached hereto is a copy of a Circular No. 196, dated 21st December 1883, issued by Colonel Grey to the District officers in this Division, on the subject of tree-planting by zamindars and the extension of arboriculture operations.

On the 3rd of May last the Commissioner addressed the District officers in a Circular (No. 69) a copy of which is forwarded herewith.

In a tract like the Hissar Division where the soil is arid and rainfall scant, the planting of the indigenous kikar should be encouraged in every possible way.* In seasons of drought like the present, the branches of the kikar trees are lopped off by the people for fodder for their cattle. This shews how thick belts of kikar trees on the road-sides might be utilized as fodder reserves for the country, the loppings being sold or given away in bad years. Possibly an arrangement might be made to fit in with a scheme for localizing the establishment (sowing or planting), and care of the road-side avenues by throwing them upon the villagers through whose land the road passes, lopping by the villages being permitted on fixed conditions as a *quid pro quo* for the maintenance of the avenues or belts.

Extensive fodder plantations of kikar and other trees would thus be raised without altogether spoiling the belts of trees as road-side avenues, (the kikar should be *not* in single *rows* but in thick belts). In the Hoshiarpur district *beri* trees are thus annually lopped for lac. The Commissioner is addressing the Deputy Commissioners in view to a workable scheme being elaborated and introduced, on this basis, on some selected road.

In the statements prescribed by Conservator's Circular No. 107, dated 23rd January 1884, the length of lines of roads, avenues &c. is given in *feet*. The District officers in submitting the returns have contented themselves with turning miles, half-miles, and quarter-miles into feet. If the standard chains (32 to a mile) were adopted, the distances could then easily be measured up by the native establishment with the help of Patwáris, and a distinct gain would be secured. It is hopeless to expect Tahsildars to measure the avenues *in feet* ; and besides such a minute standard is not required. I am sure this only requires to be brought to the Conservator's notice to be corrected.

* The Commissioner here notes that he is in correspondence with the Deputy Commissioners for organizing a scheme of kikar plantations in the several encamping grounds attached to the districts.

Avenues.

District.	Total length.	At beginning of year.	Planted during year.	Destroyed or felled &c.	At end of year.
Hissar	557,240	142,560	...	...	142,560
Rohtak	1,608,560	484,000	65,160	16,090	533,070
Sirsa	1,129,920	406,440	1,540	4,290	403,690
Total ...	3,295,720	1,033,000	66,700	20,380	1,079,320

Groves, Nurseries, Gardens &c.

District.	Total area or length.	At beginning of year.	Planted during year.	Destroyed or felled.	At end of year.
	A. R. P.	A. R. P.			A. R. P.
Hissar	50 3 26	50 3 26	...	...	50 3 26
Rohtak	105 2 8	105 2 8	...	...	105 2 8
Sirsa	166 0 0	19,423	3,487	3,775	19,135

		Income.								Expenditure.		
		Wood.										
		Lopping.	Thinning.	Dead trees.	Fruits.	Plants.	Grass.	Miscellaneous.	Total.	A. Working.	B. Establishment.	Total.
I.—Ornamental Gardens	Hissar	...	...	20	229	...	...	...	249	792	696	1,488
	Rohtak	...	...	...	...	...	...	...	...	...	...	...
	Sirsa	...	...	...	378	...	...	16	394	531	488	1,019
	Total ...	...	...	20	607	...	...	16	643	1,323	1,184	2,507
II.—Nurseries ...	Hissar	...	...	25	...	...	...	...	25	240	564	804
	Rohtak ...	...	...	...	...	...	...	...	...	...	673	673
	Sirsa	...	...	...	17	...	...	8	25	194	142	336
	Total ...	...	...	25	17	...	...	8	50	434	1,379	1,813
III.—Avenues & Groves	Hissar	...	...	41	...	...	...	...	41	223 120	530 149	753 269
	Rohtak	25	...	197	...	...	...	...	222	... 368	5,538 200	5,538 568
	Sirsa	75	4	33	...	...	...	...	112	1 ...	284 ...	285 ...
	Total ...	100	4	271	...	...	...	...	375	224 488	6,352 349	6,576 837
IV.—Afforested wastes	Hissar	...	...	...	...	...	...	...	...	...	...	...
	Rohtak ...	...	...	...	...	...	...	...	...	...	...	...
	Sirsa	...	...	...	...	...	...	...	...	3,450	...	3,450
	Total ...	...	...	...	...	...	...	...	...	3,450	...	3,450
Grand Total ...	Hissar	...	...	86	229	...	...	...	315	1,375	1,939	3,314
	Rohtak ...	25	...	197	...	...	...	...	222	368	6,411	6,779
	Sirsa	75	4	33	395	...	...	24	531	4,176	914	5,090
	Total ...	100	4	316	624	...	...	24	1,068	5,919	9,264	15,183

Copy of a Circular letter No 196, *dated* 21*st December* 1883, *issued by Lieutenant-Colonel* H. GREY, C. S. I., *Commissioner and Superintendent Hissar Division, to all Deputy Commissioners in the Division*

I would call your attention to the scheme for the encouragement of tree-planting by zamindars adopted in the Delhi district as described at pp. 3—4 of appendices to the Punjab Arboriculture Report for 1882-83. Such a scheme appears to me to be required to supplement the incitements offered by *Directions to Settlement Officers*, Appendix III, paras. 117—133, and by Financial Commissioner's Book Circular No. 34, dated 5th August 1882. It is not every one who can undertake a plantation of two acres, but one of a kacha bigah is within the power of most.

2. I would suggest that the provision in Rule VI of that scheme regarding the kind of trees to be planted, be expanded to admit farash. As mentioned in my Circular 75, dated 13th June 1883 (see page 12 of Appendices to Punjab Arboriculture Report), these trees pay the zamindars better than any other, are quickest in yielding a return, and require least care and trouble.

3. I would omit the provision in Rule VII, regarding the superintendence of thinning by the zaildar. Over-interference should be avoided. I would also omit Rule IV altogether. Our object is to get *trees*. If people think them profitable enough to cultivate in place of crops (in many parts of India an acre of timber is more profitable than an acre of any other staple that could occupy the same soil, under the same conditions) why should not they cultivate them on revenue-paying ground? The public interest does not lose but gain in the substitution.

4. With further reference to the Arboriculture report, I may remark that particular attention is required in Hissar and Sirsa to the evil referred to by the Deputy Commissioner of Gurgaon at page 8 of the appendices of that Report. It is indeed, as he says, suicidal for zamindars to completely clear an entire area of timber tempted thereto by the offers of Railway officials and others. I have not yet observed the operation of charcoal burners in this Division, but these will doubtless commence ere long in the Ghaggar and Choya valleys. In the latter, in Sirsa, I have observed reckless selling off of kikar timber to the Railway.

5. As hints in management of trees, I would particularly commend to your attention the remarks of the Commissioner of Amritsar on the advantage of transplanting vigorous saplings instead of planting out small seedlings and then smothering then by way of protection; also to the Conservator's suggestion for subsoil irrigation, at page 3 of his Report.

6. Finally, I think that use might be made of zaildars in the cause of arboriculture, as suggested by the Deputy Commissioner of Amritsar (App. p. 27), and that the District Superintendent Police and Civil Surgeon might be asked to obtain assistance thereto from their subordinates in the manner indicated by the Deputy Commissioner.

7. But after all the great means of obtaining arboricultural progress is to create a special Department and special fund therefor, as suggested in my Circular before quoted. Punjab Government letters Nos. 264 and 370. dated 3rd September and 14th November, and Government of India Resolution No. 16A., dated 1st March 1883, shew that the Government is prepared to receive proposals on this head, and even to supply funds for the purchase of plots of land. The results obtained from this course are evidenced by Ferozpur, where, as pointed out by my Circular, the operations of 1882 far exceeded those of any other district in the Province; and the present report shews this again to be the case—100,000 trees planted in two years, of which nearly eighty thousand (80,000) were safely brought up, represent operations (now existing since 1876) which are creating a property of immense value.

Copy of Circular No. 69, *dated 3rd May* 1884, *from* W. COLDSTREAM *Esquire, Commissioner and Superintendent Hissar Division, to all Deputy Commissioners in the Division.*

No replies have been received to Commissioner's Circular Memo No. 75, from the Deputy Commissioners of Rohtak and Hissar; requests they will favor officiating Commissioner, with reference to Colonel Grey's Circular, with any suggestions that may strike them for the more rapid development of arboriculture in their districts, either in the manner suggested by Colonel Grey or otherwise.

2. The subject is one of immense importance in the interests of these tracts, and merits the most careful thought on the part of District officers.

3. Of course the best result of all would be that zaildars individually, and village communites as corporate bodies, should devote their energies to arboriculture without State help; and if any plan could be hit upon by which the attention of the people could be turned in this direction, and they be roused to feel the desirability of having unoccupied lands, where possible, occupied by trees, a great good to the country would be done. Communal plantations in village lands should be encouraged in every possible way; and the legitimate influence of the Tahsildars and other revenue officials brought to bear in this direction and in the direction of aiding the zaildars, when they wish it, in drafting rules for the management, within the village, of such properties.

4. Officiating Commissioner desires to commend the matter to the best attention of Deputy Commissioners, and will be glad to receive their proposals at as early a date as convenient.

5. Although the formation of a separate fund has been negatived by Government, arboriculture receipts and disbursements are shewn in the District Funds Accounts separately, and there would be probably no difficulty in arranging that all profits from arboricultural operations carried out by Deputy Commissioner on Government lands were properly recognized and an equal sum allowed to be spent within the district.

6. Under the head Provincial too a separate head of account can easily be and is in fact kept, although no separate fund is created.

7. Recently the Government, on the application of the local authorities, has sanctioned the purchase of 463 acres of land near Fazilka at a cost of Rs. 5,179, being Rs. 11-3-0 per acre, as a tree plantation. And when opportunity of buying at a bargain land on which trees can be grown without much expense, presents itself, Deputy Commissioners should take advantage of it and apply for sanction to purchase it at once. Tahsildars should be instructed to this effect.

8. With such application should be submitted a statement in the form given below :—

Proposals for purchase of land for arboricultural purposes in_____District.

Situation and area.	Price at which it is likely to be obtained per acre.	Quality of land.	Whether soil is moist or within reach of irrigation.	What trees can be grown on it.	What the expenditure in putting down trees is likely to be (calculated to last over 5 years till trees are well seasoned.)

4. HISSAR DISTRICT.

General remarks.—The seasons in the year under review were unfavourable to arboriculture in the highest degree. The year has been one of drought and scarcity. It was only with the greatest difficulty that the nurseries and gardens could be preserved from ruin ; and practically nothing could be done in the way of extending avenues.

Arboricultural operations on a large scale were under consideration at the commencement of the year, and notices were issued to zamindars with regard to plot-planting as suggested at page 3 of the Provincial Arboricultural Report for 1882-83. But the great deficiency in the summer rains, and total failure of the winter rains, rendered all arboricultural operations practically impossible. It was intended to have purchased land for plantations in the tract under the influence of the Ghaggar overflow ; but the time of the revenue officers was entirely occupied with more pressing business, chefly connected with the depressed agricultural state of the country ; and this subject was of necessity postponed until a more favorable season. It will be taken up in the current year, if the seasons permit, and if famine is happily averted.

Description of work.—The efforts of the revenue officers and local establishments were devoted to the preservation of existing trees. Of the new ones planted, none practically survived, except in the gardens where irrigation was possible.

The Tahsildar of Hansi, however, succeeded in planting an avenue between the town and district bungalow. The introduction of a new form of statement has rendered it possible to revise the figures of former years, and to record with tolerable accuracy the real extent of existing avenues, groves, nurseries, and gardens. The inaccuracies in the statements of former years were the legacy of an erroneous system of record which had been followed for a long period extending over many years. and which it was consequently very difficult to alter or amend. We have, however, now got a " correct opening balance" in the words of para 17 of the Provincial Arboricultural Report for 1882-83 ; and it will now be possible to register extensions and improvements with tolerable accuracy.

Establishment.—No changes were made in Establishment.

Financial.—The total income from sale of dead and fallen wood and garden produce was Rs. 315. It must be remembered that the drought operated to diminish the income in many ways. No loppings were done, and there was no income from grass. Loppings (on an extensive scale) are done only every third year.

The total charges were Rs. 3,314 against Rs. 4,000 in the preceding year.

The detail was as follows :—

	Rs.
Establishment	1939
Irrigation dues	217
Feed and keep of bullocks	937
Purchase of seed and planting operations	192
Miscellaneous contingencies	29
Total ... Rs.	3,314

5.—ROHTAK DISTRICT.

General remarks.—The year was on the whole an unfavorable one for arboriculture owing to failure of rain; besides injury was caused by the hot winds and white ants, and a number of trees was destroyed. Owing to scarcity of fodder, branches of trees here and there were lopped off by zamindars for fodder for their cattle. The practice was, however, checked when brought to notice, and the District Superintendent of Police was addressed in view to the police keeping as close a watch as was practicable.

Description of work.—The only important work undertaken during the year was the planting of trees on the following roads :—

I.—*Rohtak-Panipat road.*—This road is 27 miles in length, of which one mile was planted during the year under report with 600 trees of the species noted in the progress statement. Besides, 3,022 trees were planted on this road in place of the trees that died. The percentage of success is said to be 99.

II.—*Jhajjar-Bahadurgurh road.*—Length of road 22 miles; during the year under report 60 trees were planted in 1,800 feet, of which 10 only died showing a percentage of success of 85.

III.—*Jhajjar-Kharkhanda road.*—During the year under report plantation was extended on this road to 26,400 feet, with 1,488 trees of siris, nim, kikar, shisham and khachnal, out of which 81 were successful.

IV.—*Sampla-Beri road.*—Length of road 11 miles, of which one mile in the Sampla tahsil was planted during the year under report with 240 trees of the species noted in the progress statement, of which 30 died; percentage of success is 87 on this road.

V.—*Gohana-Butana road.*—500 trees were planted on this road in 10,500 feet, as noted in the statement of avenues. Besides 92 were planted in place of those that died: thus the total number of trees planted during the year under review was 292, of which 5 died, showing a success of 99.

VI.—*Bhiwani-Shamli road.*—During the year 1883-84, 1,407 trees were planted on this road as noted below :—

Newly planted in 15,840 feet ...	...	800
In place of those that died ...	...	607
		1,407

of which 412 died.

The following table will show Tahsilwar the aggregate number of trees planted and that died during the year under report.

Tahsil.	*Planted*	*Died.*
Rohtak	950 ...	167
Jhajjar	983 ...	339
Gohana	2,355 ...	633
Sampla	872 ...	240
Total ...	5,160 ...	1,379

The large percentage of success, notwithstanding total failure of rain, is attributed in a great measure to the vigilant supervision exercised and to the employment of a large number of bhistis during the 12 months of the year, which resulted in the expenditure of the current year being larger than in the year previous, in which latter it amounted to Rs. 5,295 and in the former Rs. 6,779.

I may also note here that a garden has been laid out in the station, to the west of the road leading to my bungalow, and planted with fruit trees, which are in a flourishing condition.

Lopping and pruning.—I have nothing to add to the remarks made in the report for 1882-83, *i.e.*, the work of lopping is done by persons specially appointed for this purpose.

Nurseries and plantations.—Young trees are planted during the months of February, March, and July from the six nurseries in the district—two at Sadr, three at Jhajjar, and one at Gohana, which fully meet the requirements of the district. There are no other plantations in the district either on Government land or on lands possessed by zamindars.

The instructions issued by Colonel Grey regarding the extension of arboricultural operations at convenient places in each tahsil have been widely made known to all the leading zemindars of the district, but as I have already stated in my No. 270, dated 9th May 1884, nothing could be done during this year owing to failure of rain.

As soon as the weather will admit of the operation, every effort will be made to carry out the wishes of Government on the subject of planting fruit trees and trees suitable for fodder round wells, tanks, and natural depressions.

The remarks of Government on this subject, recorded in the printed Arboricultural Report for 1882-83 were laid before the Committee held on 25th of January 1884, and it was resolved that the zaildars be requested to keep a list of groves in their zail, and that the Committee is ready to aid this as far as it lies in its power.

Fences.—The fences used in this district are generally of thorns, and in some cases mud *thauwlas* are made round saplings to prevent them from being eaten up by cattle.

Establishment and supervision.—The following is the staff of the establishment kept up during the year for arboricultural purposes :—

1 Jamadar,
3 Head malis,
38 Malis,
56 Bhishtis.

The establishment detailed above are under the direct supervision of the Tahsildar. The work of supervision is done by tahsil subordinates. They, as well as the Tahsildars, happen to go on duty into the interior of their tahsils.

Financial results.—The subjoined table will show the total income and expenditure, detail of which are given in the enclosed statement :—

	Receipts.		Rs.
Sale of trees	...	...	222
	Expenditure.		
Pay &c. ...	...	...	6,779
	Deficit	...Rs.	6,557

Statement showing the strength of the Arboricultural Establishment employed during the year 1883-84.

Name of tahsil.	Strength of Establishment.						Remarks.
	Jamadar and Head mali.		*Máli.*		*Bhisti.*		
	No.	Salary.	No.	Salary.	No.	Salary.	
		Rs.					
Rohtak	1	12	14	Rs. 4 & 5 p. m.	15	Rs. 6 & 7 p. m.	
Jhajjar	1	6	9	5 p. m.	20	6 p. m.	
Samplá	1	7	7	5 p. m.	13	6 & 7 p. m.	
Gohána	1	7	8	4 each	8	6 p. m.	
Total	4	...	38	...	56	...	

6.—SIRSA DISTRICT.

Part I.—Statistics.

Statements showing the work of road avenues, groves and gardens and nurseries done during the year.—The form of the statement prescribed by the Conservator of Forests and approved by Government in para. 5 of His Honor the Lieutenant-Governor's remarks on the report on Arboriculture for 1882-83,—No. 451, dated 24th October 1883,—has been adopted. I submit separate statements for road-avenues, groves and gardens, and nurseries, as suggested

by the Conservator in the 17th para. of his report. From these statements the result of the work done appears very gloomy indeed. As regards road-side trees, and trees in groves ground was actually lost. The roads show worse by rather more than half a mile of length, and the groves have several hundred trees less than they had on 1st April 1883. The nurseries indeed show a small gain, but even this was diminished owing to the almost entire failure of winter rain and the falling-in of the well in the Sirsa station garden; so that Sirsa cannot speak well of 1883-84 as regards arboriculture.

Part II.—Narrative.

(1).—*General remarks.*

Remarks on the rain-fall.—There is a slight improvement in the rain-fall of this year as compared with that for the preceding year,—it being 15·3 in 1883-84 against 14·31 in 1882-83. It was, however, less than the average fall (16·37) of five previous years, so that new work cannot be thought to have been begun auspiciously. The winter rain was very deficient, and even full grown trees generally look as though they find it very hard to live. Failure in planting operations has therefore some show of reason when attributed partly to natural causes.

(2).—*Description of work.*

Maintenance of road-side trees and trees in gardens and groves.—It appears that some trees were transplanted from the nurseries to fill up the road-side gaps left by the removal of dead trees or by failures. The trees transplanted were about three feet high. In groves and gardens some trees were also planted. In the Station gardens at Sirsa seeds of pomegranate and citron were sown and they are in a healthy state.

Experimental sowings.—Carob and Eucalyptus seeds were received from the Agricultural Gardens, Lahore, and sown in the Station gardens at Sirsa. They grew to a certain height and then died. Eucalyptus has often been tried with a similar result.

Nurseries, protection of trees, pruning, lopping and digging of trees.—The mode of operations as regards nurseries, fencing young trees, lopping of branches, &c., is that mentioned in last year's report. There appears no need to recite these trite facts once again.

The future of arboricultural operations.—This report on the whole must be taken as showing how very little has been done in this district in the way of arboriculture, and how very much there remains to do. Present circumstances do not favour the deliverance of didactic utterances as to the proper mode of conducting operations. This is I suppose the last time an arboriculture report will be sent up from Sirsa as a district. Yet I cannot resist the opportunity of recording my personal conviction that though Sirsa is much worse off than most districts as regards natural advantages of irrigation and moisture, yet even here the bareness and aridity of the place would not sustain the well-directed attack of continuous and intelligent energy. Patient action on the lines indicated by the Conserrator of Forests in his last year's report would do much. The new canals coming in to Fazilka supply a good point whence to start a systematic scheme of planting. The lower lands near the Ghaggar would, if used properly, give another, and on the dryer tracts plantations should be made near tanks and drainage channels to be extended in good years of rain-fall. The game would be a winning one if it were played patiently and boldly, but both patience and boldness are wanted. In the division of the district soon to be made, the northern part will probably benefit from the active system prevalent in Ferozepore, favoured as it is by the moisture of inundation canals.

Rules regarding "Inams" for zamindars' plantations.—I observe that the rules which I drew up for Delhi last year as to "inams" for zamindars' plantations have been adopted here by Mr. Gardiner, who, had he remained, would doubtless have followed the measure up. But mere circulation of rules is worth little; what is wanted is importunate persistency in drawing the attention of the people month by month and year by year in the same way and to the same facts. Nothing can be expected quickly; everything will yield to patient energy.

Purchase of five biswas of mouzah Keruwala for an experimental tree plantation and the future success of the experiment.—In tahsil Fazilka of this district five biswas of mouzah Keruwala, comprising an area of 423 acres one rood and 5 poles of land, have been purchased with the sanction of Government, for an experimental tree plantation. Measures are being taken to carry out the scheme as proposed, and the result of the experiment will I suppose form part of the Ferozepore report next year. Short as is to be my stay in the district, I hope to see in person something of this work, one of the most interesting of its kind. Such planting should not only be good for the district in increasing greenness and vegetation, but actually remunerative. We have a practically unlimited market here I presume in the railway for any quantity of wood.

Establishment and supervision.—The establishments for the nurseries and gardens and for the maintenance of road-side trees are as follows :—

Nursery Establishment.

	Rs.	A.	P.
1 Mali @ Rs. 6 per mensem	72	0	0
1 Coolie @ Rs. 5 „	60	0	0
1 Sweeper @ Rs. 1 „ (allowance from May 1883 to February 1884)	10	0	0
	142	0	0

GARDEN ESTABLISHMENT.

	Rs.	A.	P.			
1 Mali @ Rs. 8 per mensem	96	0	0			
1 Coolie @ Rs. 5 „	60	0	0			
6 Coolies @ Rs. 4 each „ from 1st March to 21st July 1883 (5 months)	112	0	0			
6 Coolies @ Rs. 5 each per mensem from 1st August 1883 to 29th February 1884 (7 months) ...	208	0	0			
1 Coolie @ Rs. 1 per mensem	12	0	0			
				488	0	0

ROAD-SIDE TREE ESTABLISHMENT.

	Rs.	A.	P.			
1 Bhisti @ Rs. 6 per mensem	68	0	0			
1 Coolie @ Rs. 5 „	60	0	0			
8 Bhistis @ Rs. 2 „ (allowance) ...	156	0	0			
				284	0	0

They are directly under the supervision of the Tahsildars. The tahsil subordinates also take a share in the supervision of the work. But it would appear doubtful from the forlorn results of the operations of the year whether the Tahsildars and their subordinates think of the work as a part of their legitimate duty. The funds no doubt are small, but they do not seem to have been made to go as far as they should.

Financial results.—I submit a statement in the form prescribed by the Conservator of Forests in para. 18 of his Report on district arboriculture for 1882-83, the adoption of which has been sanctioned in para. 5 of the Government proceedings No. 451, dated 24th October 1883. It will be observed from this statement that there is a deficit of Rs. 4,559. This amount, however, includes only Rs. 1,109 as cost of the operations of the year, the rest Rs. 3,450 is on account of the purchase of five biswas of mouzah Keruwala for an experimental tree plantation as adverted to in para. 9 of this report. This experiment which under sanction of Government, No. 264 of 3rd September 1883, is charged to Provincial revenues, should prove a success, and it is to be hoped that Government may in following years be able and willing to make some such special grant in the way of helping this very unfavourably situated portion of the Province.

The income of this year was credited to the District Fund.

UMBALLA DIVISION.

Remarks by Commissioner.

Umballa.—The rainfall shown in Col. VII of the statement appended is for the year under report only, whereas it should show in addition the average of past years. The attention of Deputy Commissioner will be called to this omission.

The average fall of past years is 24·6 inches, and that of 1883-84, reported in the statement, is only 14·6, a large deficiency and of a nature to seriously retard progress in tree planting, and in young plantations. It is therefore not surprising to find it reported that of the 3,350 trees which fell or died during the year, 3,000 were young trees.

4,964 trees were planted to fill up gaps and blanks of old avenues, as compared with 3,489 of the previous year, the percentage of successful planting was more favourable than that year, being 68·48 to 54. The trees planted were chiefly shisham, and here and there mulberry, jamun &c. The mulberry, as the Commissioner has often remarked, is useless as a roadside tree; mangoes and nim trees grow best in the Umballa district.

It is to be regretted that the number of nurseries has fallen from four to one. The cause has not been stated by the Deputy Commissioner; he has been asked to explain.

The receipts were higher than in the previous year, being Rs. 1,888 to Rs. 1,807. The charges also fell from Rs. 2,438 to Rs. 2,090; the deficit was accordingly only Rs. 202, as compared with Rs. 631 of the previous year.

The Commissioner is addressing the Deputy Commissioner specially on the subject of arboriculture.

Ludhiana.—The rainfall in the Ludhiana district was not altogether favorable for arboriculture in the year under report. The average of past years was, it is true, exceeded, but there was a long break in the whole month of August, followed by a similar break in October.

Operations were again this year mainly confined to filling up gaps and blanks in existing avenues. The number of trees planted was 2,287, as compared with 3,696 of the previous year. The number of failures is not reported, though Deputy Commissioner was requested in this office No. 171, dated 16th July last, to supply this information.

5,280 feet of single lines were planted with trees on the Sidhwan road, all of which failed, and 2,560 feet of single lines on the Jagraon road, which, on the other hand, were successful. The Deputy Commissioner does not explain the cause of the failure on the Sidhwan road, which stands out in striking contrast to the complete success on the other road. He has been requested to do so.

The different kinds of trees planted were the shisham, siris, jáman, bor and pipal. The plan Mr. Wakefield started some years ago of growing a banyan or pipal tree for shade at every mile-stone, is a good one, and the Commissioner hopes will be fully carried out.

Lopping continues to be carefully performed in this district.

There are five nurseries to three of last year, an additional one having been started at the Sadr, and one at Jugraon. The people are beginning to take more interest in tree planting than before, and have commenced procuring trees and plants from the nurseries.

The receipts amounted in this district to Rs. 2,638 and expenditure to Rs. 4,578, showing a deficit of Rs. 1,940, as compared with a defecit of Rs. 1,825 in the previous year. The difference is small.

Simla.—Arboriculture in the Simla district was confined to the planting of 607 trees, deodar, horse-chestnut and willows, by the Municipality, and a few trees in the Kalka bazar and at Kasauli. Only 290, or about 50 per cent., of the trees planted at Simla can be confidently stated to have survived, though it is expected that many in which there are at present no signs of life will revive during the rains. The other work of fruit tree planting by the Superintendents of the Annandale gardens, comes, the Commissioner takes it, more under the head of Agri-Horticultural operations.* It is, however, very desirable that the results of the expensive fruit tree operations at Simla should be yearly reported to Government, and this is perhaps the best opportunity for so reporting. Therefore, with reference to the concluding portion of the Deputy Commissioner's letter, it would perhaps be as well for him to submit a report on arboriculture for his district; and a modification of the order* of Government is sought accordingly.

* See Government letter No. 259F, dated 25th May 1881, to Conservator's address.

7.—UMBALLA DISTRICT.

General remarks.—During the year under report the rainfall was much less than the average fall of five previous years, which has stopped the progress of new plantation and also greatly damaged the young trees planted during the last few years.

Description of work.—The work done during the year consisted chiefly of filling gaps and blanks in avenues and preservation of trees previously planted against the season of drought. 1,964 trees were planted to fill up gaps on roads of which 1,345 were successful, showing 68·48 percentage of successful trees.

The total number of trees which have fallen by winds or died during the year is 3,350, of which 356 matured trees, 2,375 young trees of previous year's plantation, and 619 of last year's plantation.

There were four nurseries at the beginning of the year, of which only one is remaining at the close of the year—on Umballa and Pihewa road.

No groves were planted.

Establishment and supervision.—24 malis and 16 bhistis were employed during 1883-84 for maintenance of avenues. These malis lop the branches of full grown trees with saws which prevents fractures, but great boughs 20 feet from the ground are not cut. Their work is supervised by the Tahsildars, Naib Tahsildars, tahsil jamadars, district overseers, and mistris.

Financial result.—The following is a detail of income and expenditure of avenues during the year under report, showing a deficit of Rs. 201-13-4 against Rs. 630-15-9 in 1882-83 :—

Receipts.

	Rs.	A.	P.
Sale proceeds of withered and fallen trees including pruned branches	1,434	4	0
Sale proceeds from fruit	259	8	0
Sale from lac	194	0	0
Total ...	1,887	12	0

Charges.

	Rs.	A.	P.
Pay of 15 malis @ Rs. 5 each per mensem ...	900	0	0
Pay of 7 malis @ Rs. 4 „	336	0	0
Pay of 1 mate @ Rs. 7 „	84	0	0
Pay of 1 mate @ Rs. 6 „	72	0	0
Pay of 16 bhistis for 8 months @ Rs. 5 each p. m.	640	0	0
Cost of fencing, tools &c. &c.	57	9	4
Total ...	2,089	9	4

8.—LUDHIANA DISTRICT.

General remarks.—Total rainfall during the year under report was 29·8 against 23·9 in the last year. The annual average fall of rain for the past years, as reported by the Meteorological Reporter to Government of India and attached to Circular No. 6 A, dated 20th

September 1883, from the Commissioner of Settlement and Agriculture, Punjab, was 26 inches. It would thus appear that the rainfall during the year was above the average, but was not seasonable, being after long intervals, and the consequence was an average crop.

Description of work.—Avenues on road sides.—2,287 new trees were planted in lieu of those destroyed as detailed in the tabular statement. They were chiefly shisham, siris, jaman, bor and pipal. Attempts to grow mango trees in this district appear to have failed, as there are some trees of very old standing in the station which are stunted in growth and are never known to have borne any fruit. Jáman trees thrive well, and about 10 per cent. of this species have already been planted along the roads, and their proportion will be gradually increased.

Bor and pipal trees are Indian evergreens, and their longevity and shade have been so far recognized by the natives that the Hindus are enjoined by the religion to water and maintain these trees, and it is due to this perhaps that so many of these trees are seen flourishing in this district. Their wood, however, is not of any use, and I am therefore limiting the number planted and planting more shisham and jaman trees. They both make excellent timber, and the latter is a fruit tree, its wood being also useful, but it is very slow growing.

I am trying to rear a good banyan or pipal tree for shade at every mile-stone. I commenced this some years ago. They make a useful mark and afford good shade to travellers, besides being a convenience to the cultivators of the village in which the land is situated.

Lopping.—Lopping in this district is carried on with great care under the supervision of skilled gardeners from the station garden. Axes are never used except for lopping small branches. All larger branches are cut by means of saws, so as to prevent fractures. Lopping is performed in the months of December and January, or shortly before the spring sprouting commences, and while the sap is dormant.

Nurseries.—There are five nurseries in the district—two at Sadr and one at Bassian, and one each at Jagraon and Samralla tahsils. Saplings of shisham, jaman, pipal, pomegranate, lime trees, and orange trees are reared for plantation along the district roads, and also for distribution gratis to the zamindars applying for them. Applications are made by the zamindars now and then for saplings, and they are freely supplied. They often plant the trees in gardens or near their wells, but no special interest is taken by them in promoting arboriculture. As fodder, timber, and fuel are very important necessaries of the country, the matter deserves our more serious attention, and as suggested in my report last year, I would again bring to the notice of Government the necessity for imposing some legal responsibility in this matter. The preparation of the rules under the new Land Revenue Act now believed to be under consideration; the question of legislation for arboriculture might be provided for.

During my winter tour I make it my duty to impress the necessity for promoting arboriculture, and people have commenced getting trees and plants from the Bassian nursery as also from the Sadr.

Establishment and supervision.—The following establishment was maintained:—

	Rs.
80 bhistis for watering young trees on road sides and also nurseries for 10½ months @ Rs. 4 each p. m.	3,360
11 Watchmen @ Rs. 5, 6, and 7 p. m.	696
Total ...	Rs. 4,056

The above establishment is under Tahsildars who use the assistant overseer of their tahsils to aid them.

Lopping is performed by daily labor, no permanent establishment being necessary. Rs. 2,638 were realized by lopping, &c., and credited to Government.

Financial results.—I annex a statement in the form suggested by the Conservator of Forests in his last annual report showing the financial results for the year under report.

Income.	Wood.			Fruits.	Plants.	Grass.	Miscellaneous.	Total.
	Lopping.	Thining.	Dead trees.					
I. Ornamental gardens ...	...	...	...	...	...	...	...	...
II. Nurseries ...	...	...	...	...	...	...	...	...
III. Avenues and groves...	523	275	1,066	...	...	774	...	2,638
IV. Afforested wastes ...	...	...	...	...	...	...	...	...

Expenditure.	A. Working.	B. Establishment.	Total.
I. Ornamental gardens...	...	...	...
II. Nurseries	46	264	310
III. Maintenance and repairs of established avennes and groves...	476	3,792	4,268
IV. Extension of avenues and groves	...	...	...
V. Afforestation of waste land	...	...	...
Total ...	522	4,056	4,578

The result is satisfactory.

9.—SIMLA DISTRICT.

General remarks.—The Assistant Commissioner at Kasauli reports that a few trees were planted in the Kalka bazár and at various points in Kasauli.

The Deputy Commissioner would draw Commissioner's attention to his office No. 1,720 of the 5th September 1881, giving cover to Secretary to Government's No. 373 F of the 3rd idem, in which it is distinctly recorded that Arboriculture reports from Simla would not in future be needed.

This will explain why none was furnished.

Copy of No. 378, *dated* 19*th June* 1884, *from the Vice-President to the Municipality, Simla, to the Deputy Commissioner, Simla.*

With reference to your request to be furnished with a report on the Arboricultural operations carried on by the Simla Municipality during 1883-84, I have the honor to state that during the year in question but little has been done in this line within Municipal limits.

2. Altogether 607 young trees were planted at a cost of Rs. 491, of which only 290 (as per subjoined details) are at present certainly alive. But this is not the proper season at which to determine the percentage of survivals, as during the rains many that now seem dead will in all probability break from the bottom and make after all good trees.

Names of plants.	*Numbers of trees planted.*	*Numbers now certainly alive.*
Deodar	200	60
Horse Chestnut	100	50
Willows	307	180

3. Besides these small plantings, which can alone perhaps be classed under the head of arboriculture in the sense to which the required return is intended to refer, a great deal has been done in the way of planting fruit trees and bushes both at Annandale and on the catchment area.

At Annandale (as will be seen from the annexed Statement A.) nearly 6,000 trees and bushes of 17 different species were planted at a total cost of Rs. 550, of which excluding strawberries and raspberries about 90 per cent have survived. But of these plantings only 259 were permanent, the rest were planted out *to nurse*, and will be permanently planted out during the current and next years according to the progress they make.

5. On the catchment area, as is shown in Statements B & C, over 7,000 fruit trees were planted out at a cost of Rs. 5,000. Of this Rs. 3,400 (in round figures) were absorbed in the actual work of planting, watering, and freight from Ranikhet, Kamaon &c., and the like, and the remainder was expended in purchasing and importing trees from England and the construction of a small gardener's house on the catchment area. Of the trees planted 3,173 were permanently planted, that is to say, they are intended to grow and fruit where now located ; the remainder (the less robust of the plants) being planted in nurseries, where they can be more easily and cheaply watered and nursed, and these will be planted out or distributed during the present and coming year as they attain sufficient strength. Of the permanent plantings, excluding the badly packed apples received from Kamaon, fully 90 % are, it is believed, established. Of the weaker plants, few, if any, included in the list are dead, but as to their ultimate survival nothing certain can be said until after the rainy season. Probably of those that we plant ourselves (for a good number are intended for distribution when stronger) fully 90% will become established.

6. The entire credit for these operations at Annandale and the catchment area, which have been on the whole exceptionally successful, in due to Mr. H. Parsons, Superintendent of the Annandale Gardens.

STATEMENT A.

PLANTING OPERATIONS AT ANNANDALE, 1883-84.

NAMES OF TREES.	Permanent situations.	Nursery rows.	Percentage living.	REMARKS.
Apples	160	30	75	Part of stock received 1882-83.
Pears	55	40	90	Ditto ditto ditto.
Peaches	10	150	95	Ditto ditto ditto.
Nectarines	2	50	95	Ditto ditto ditto.
Plums	16	10	90	1883-84.
Apricots	16	50	85	1882-83.
Spanish Chestnuts ...	...	100	90	ditto.
Cherries	...	110	95	1883-84.
Figs	...	95	98	ditto.
Mulberry trees ...	...	6	80	Arrived from England 20th March 1884.
Medlur ,, ...	...	6	80	Ditto.
Damsons	...	6	80	Ditto.
Strawberries	...	200	25	Ditto.
Gooseberries	...	24	75	Ditto.
Currants	...	36	100	Ditto.
Raspberries	...	100	25	Ditto.
Nuts	...	12	95	Ditto.
Apple Stocks	...	3,587	95	Including 600 one-year-old trees raised from seeds.
Other fruit stocks ...	...	1,000	...	For pears and stone fruits.
TOTALS ...	259	5,612	...	

Cost of the whole including digging pits, trenching ground, planting and clearing away stones thrown on the surface,—Rs. 550.

STATEMENT B.

STATEMENT SHOWING COST OF PLANTING OPERATIONS, CATCHMENT AREA, AND APPROXIMATE SURVIVALS.

NAMES.	Percentage living.	REMARKS.
Apples, Ranikhet	90 to 95	
Do. Kumaon	50	Grafts dead; majority of stocks alive of remainder.
Pears, Ranikhet	85	The large number of Kumaon trees which have died is entirely owing to keeping them out of the ground a long time before despatch, and from faulty packing. Trees properly packed bore the journey better from England than Kumaon.
Peaches do.	90	
Nectarines, Ranikhet	90	
Apricots do.	90	
Plums do.	85	
Chestnut do.	90 to 95	
Other fruits	85 to 90	

COST OF PLANTING.

	Rs.	A.	P.	
Tools	333	12	0	
Freight	631	9	0	
Contract labor	782	7	0	
Daily do.	1,658	0	0	December to March inclusive. The balance of the Rs. 5,000 goes to the house, purchase of English trees, and contingencies.
TOTAL	3,405	12	0	

STATEMENT C.

STATEMENT SHOWING THE NUMBER AND VARIETIES OF FRUIT TREES PLANTED ON THE CATCHMENT AREA.

IN PERMANENT SITUATIONS.				IN NURSERY ROWS.		
Varieties.	No. of trees.	Distances.	Area.	Varieties.	No. of trees.	
			Ac. yds.			
Apples	912	24'×24'	12—738	Apples	2,604	
Pears	746	24'×24'	9—4,581	Pears	651	
Peaches	828	15'×15'	4—1,404	Peaches	502	
Apricots	346	24'×24'	4—2,968	Nectarines	150	
Plums	261	24'×24'	3—2,323			
Chestnuts	80	24'×24'	1—448			Other varieties planted at Annandale, *vide* separate statement.
Common Plums and Cherries ...						
TOTAL ...	3,173	...	35—2,712	TOTAL ...	3,907	

JULLUNDUR DIVISION.

Remarks by Commissioner.

Remarks.—The rainfall of the year was considerably below the average; as a consequence the season was an extremely unfavorable one for arboricultural operations, and little new work was undertaken in the Division, the energies of the establishment having been chiefly directed towards protecting and maintaining the previous year's plantings, and, in the case of

the Jullundur district, filling gaps. In the two plain districts of Jullundur and Hoshiarpur this deficiency in the rainfall is reported to have caused the loss of many young and valuable plants, and, in Jullundur, to have necessitated the employment of a large extra watering establishment.

Complaint is made in the Jullundur and Hoshiairpur districts regarding the bad quality of the seeds supplied during the year by the Agri-Horticultural gardens at Lahore, to which a contribution is annually made by them. In the Kúllú sub-division of the Kangra district a system has been successfully introduced by the Assistant Commissioner of giving prizes to such Lambardars as exert themselves in the cause of arboriculture. This is in accordance with the suggestion made in para. 3 of the Government review of the Report for 1882-83, and it is proposed to try the plan in other parts of the district.

A good deal of useful work was done in the Jullundur district in filling up gaps and blanks in existing avenues. At the same time about six miles of new avenues were also planted on the roads from Jullundur to Tandah, from Phillour to Samrái, and from Bangah to Garshankar, and altogether 7,120 trees were planted, of which a considerable percentage is reported to have succeeded. The trees were, as usual, chiefly shisham, which, besides yielding valuable timber, is more adapted to the soil of the district than any other kind of tree. In the number of plantations there was apparently a diminution, for in the district report mention is made of only 23 plantations, whereas in the year before there were reported to be 46. What has become of the other 23 the Deputy Commissioner will be requested to explain. On the other hand, nine new nurseries were established during the year; and thus the total number now in the district is 21. These nurseries seemingly continued to be an efficient source of supply, for no less than 8,996 trees were taken therefrom; of which 1,120 were given gratis to zamindars. On the whole, the operations in this district, as far as they went, may be said to have been carried out with a marked degree of judgment and success, the drought notwithstanding. The credit for this is chiefly due to Mr. Bullock, the late Deputy Commissioner.

Hoshiarpur.—The report of the Hoshiarpur district is written by the District Engineer, Mr. Faddy, and it is meagre and unsatisfactory. It would appear that no new avenues were formed, but yet the number of miles of avenues is spoken of as being 438, as compared with 277 reported to exist in the previous year: explanation of this will be asked.

The encamping-grounds are probably now all planted so far as this is desirable. No further operations were undertaken for the reclamation of the *chos*; indeed the maintenance of the existing avenues and thinning out old trees constituted the work of the year.

Kangra.—In the Kangra district, notwithstanding the deficient rainfall, 29,083 trees are reported to have been planted, out of which more than 50 per cent. were successful. The cost of planting these appears to have been Rs. 466 only, or at the rate of about 1 pice per tree; unless unremunerated labor was resorted to, it is difficult to understand these figures: the Commissioner has therefore referred to the Deputy Commissioner for explanation. The trees were as usual, chiefly tun, shisham, mango, mulberry and jáman. The nurseries are said to be well stocked with a variety of plants, and to be sufficient in number for the requirements of the district.

The matter of trimming and pruning trees continued to receive due attention in all three districts, though in many instances it was necessarily effected by means of untrained agency, but under the general supervision of the Tahsildars. The Commissioner cannot think, however, that this is work which should be given on contract, as was done in the case of one tahsil in the Jullundur district.

In connection with this subject the Commissioner trusts that when the District Boards are formed it may be found possible to get them to employ a trained forester in each district to look after cutting and pruning; the benefit of supervision of this nature is very marked in the case of the Kapurthala territory in this Doab. In the Jullundur district, besides 36 bhistis temporarily employed, the establishment consisted of 1 Darogah, 5 peons, and 46 malis and coolies, being 1 peon less but 31 malis and coolies more than in the previous year; but this includes the establishment attached to the following public gardens, the cost of which has now for the first time been amlgamated with the expenditure on arboriculture, *viz.*, the Empress, Narain and Katcheri gardens at Jullundur and the Baradari garden at Nawashahr, concering all which particulars are given in the district report. The strength of the establishment in Hoshiarpur was the same as in the year before, that is, 3 jamadars and 97 malis and coolies, who were, as usual, supervised by overseers, of which, however, the number is not stated. In the Kangra district there is, it is said, no regular establishment, except at Dharmsala, where two gardeners and a *rakha* are employed. The work here is done by coolies, temporarily engaged, under the supervision of the Kotwals and Tahsildars. But, as noticed by Colonel Jenkins in his last para. the Commissioner has lately had to point out that the plan of making the zamindars keep up the trees at their own cost, is one which will for the future have to cease absolutely, and the charge for establishment and cost of maintenance is likely therefore to be much enhanced next year. The expenditure (Rs. 192) was much the same as in the preceding year.

8. The receipts in the several Districts were :—

Jullundur	Rs.	4,497	compared with	Rs.	4,281 in 1882-83.
Hoshiarpur	„	14,135	... ...	„	7,714
Kangra ...	„	182	... ...	„	296

and the expenditure :—

	Rs.		Rs.
Jullundur...	5,991	against	3,069 in 1882-83.
Hoshiarpur	5,849	...	6,004
Kangra ...	1,170	...	2,472

There was thus a surplus only in the Hoshiarpur district, to the large extent of Rs. 8,286 ; at the same time, while the receipts largely exceeded those of the previous year, the outlay was somewhat less. These large receipts in Hoshiarpur are due to the felling of hundreds of old trees of inferior sorts which are being replaced by more valuable kinds, but the present large receipts reported must not be looked for always, as it stands to reason that these cuttings cannot long be maintained on this scale. The deficit in Jullundur was merely nominal, for, if the income and expenditure of the ornamental gardens alluded to in para. 7 and which were not accounted for in the year before, be omitted, the excess of expenditure over income amounted only to Rs. 245, which may be said to be due to the extra staff of bhistis entertained. Rs. 988 was the deficit in Kangra, which, however, is an improvement as compared with the deficit of Rs. 2,196 in 1882-83.

10.—JULLUNDUR DISTRICT.

General remarks.—The rainfall during the year under report was 13 inches, while the average rainfall of the district is 31 inches. This deficiency in the rainfall has unfavorably affected arboriculture, causing the loss of many young plants and rendering necessary the employment of a larger watering establishment.

Description of work.—Operations were chiefly confined to the following roads and nurseries—

(a) Roads—(1) Jullundur and Tandah road, 19 miles.—19 miles of this road lie in this district. The first 13 miles had been planted with a single avenue during previous years, and a further distance of 2½ miles has this year been newly planted with 1,000 shisham trees of which 900 or 90 per cent are in good condition.

(2) Jullundur to Hoshiarpur city branch, length 27,040 *feet.*—120 shisham trees were planted during the year to fill up gaps and blanks in the existing avenue of which 12 have failed.

(3) Jullundur Cantonment to Khajurla, length 11,880 *feet.*—160 shisham trees were planted during the year to fill up gaps and blanks in an old avenue, and of these 145 were successful.

(4) Jullundur City to Cantonment, via Ladowal, length 13,200 *feet.*—Out of 90 shisham trees planted to fill up gaps and blanks, 10 died.

(5) Jullundur to Nakodar, length 79,200 *feet.*—This road has an avenue of trees throughout the whole length. This year's work was confined to filling up gaps and blanks. 850 shisham trees were thus planted, of which 35 died, and the rest are doing well.

6. *Nakodar to Nurmahal, length* 36,960 *feet.*—Gaps and blanks were filled up by the planting of 700 shisham trees on that portion of the road which lies in the Nakodar tahsil. All these have been successful.

(7) *Phillour to Sumrai via Rurko, length* 79,200 *feet.*—Eight miles of this road had been planted with a single avenue in previous years, and an extension of two miles has been made this year by the planting of 1,056 shisham trees, nearly all of which are in a flourishing condition.

(8) Phagwara to Bangah, length 62,240 feet ; (9) Bangah to Rahon viâ Nawashahr, length 63,360 feet ; (10) Rahon to Phillour, viâ Awar, length 63,360 feet ; (11) Nawashahr to Jadlah, length 34,320 feet.—Each of these 4 roads has an existing but patchy avenue of kikar and other trees which are fast dying of old age. Shisham trees have this year been planted 30 feet apart on both sides of the roads to fill up gaps which have occurred in various places. It is intended to follow this plan throughout the whole lengths of these roads until the avenues have been entirely renewed.

1115 shisham trees were thus planted during the year under report over the first 33,450 feet of the Phagwara and Bangah road, and all are doing well. 665 shisham trees were planted over 19,950 feet of the Bangah to Rahon road, of which 70 died, and the rest are flourishing.

670 shisham trees were planted over the first 20,100 feet of the Rahon and Phillour road, of which nearly all have been successful, and 521 on the Nawashahr and Jadla road with similar results.

(12) *Nawashahr to Garhshankar, length* 18,480 *feet.*—15 shisham trees were planted during the year to fill up gaps and blanks, all of which have died.

(13) *Bangah to Garhshankar, length* 31,680 *feet.*—The previously existing avenue on this road has been extended by 7,500 feet by the planting of 250 shisham trees, all of which are doing well. A length of 31,680 feet still remains to be completed.

The plan previously adopted of limiting operations to particular roads till they were finished continued with good results.

Shisham is the only kind of tree planted this year on road-sides. Its timber is valuable and its foliage gives good shade, while at the same time it is more adapted to the soil of this district than any other kind of tree.

In all 7,120 trees were planted on the roads-sides during the year. Last year's number was 7,668. The transplants were of a height of not less than three feet. Only overhanging branches were lopped. The lopping was done in the Jullundur tahsil by *naukar coolies* on the Tandah road; in the Phillour tahsil it was done on the Rurka and Nurmahal roads by contract; in the Nawashahr tahsil on three roads by *naukar coolies*, and on five roads by contract.

Operations were carried on under the immediate supervision of the tahsil mistris, and the general supervision of the Tahsildars.

(*b*) *Nurseries.*—There are now 21 nurseries in the district, of which 9 were established during the year under report at a cost of Rs. 1,288, including maintenance. They are located as follows:—

No.	Tahsil.	Name of road.	Village.	Area.
				A. R. P.
1	Jullundur	Jullundur to Tandah	Kurasian	0 0 16
2	Ditto	Alawalpur to Kartárpur	Dugri	0 0 32
3	Nakodar	Jullundur to Nakodar	Kung	0 2 20
4	Ditto	Nakodar to Nurmahal	Nawapind	0 2 20
5	Phillour	Phillour to Bara pind and Dosang ...	Barapind	0 2 20
6	Ditto	Phillour to Nurmahal	Begumpur	0 2 20
7	Nawashahr	Phagwara to Bangah	Bahram	0 2 20
8	Ditto	Rahon to Phillour	Awar	0 2 20
9	Ditto	Bangah to Ráhon...	Rahon	0 2 10

In all these shisham is the only tree cultivated. Trees were largely tranplanted from the old nurseries of Nurmahal, Powari, Bangah, Nawashahr, and Jullundur, and the space cleared was resown excepting two roods in the Powari nursery.

In addition to 7,120 trees planted on road-sides from the nurseries, 756 were given to the Executive Engineer and the Military Department, and 1,120 plants free of cost to zamindars.

In 1882-83 895 were given to the zamindars. Rs. 308 was realized by sale of fruit and vegetables from the Jullundur sudder nursery.

Plantations.—There are 23 Government plantations on the bank of the Sutlej, *viz.*, 8 in Phillour tahsil, 14 in Nakodar, and 1 in Nawashahr. Rs. 61 were realized from them by sale of grass and dead trees.

Public gardens.—The following public gardens in the district were in former years noticed in the District Fund Report, and their cost is now for the first time amalgamated with the expenditure on arboriculture.

(1) *Empress garden.*—The Empress garden at Jullundur is maintained jointly by the District and the Municipal Committees. The income and expenditure during the year were normal, and amounted to Rs. 467 and Rs. 1,272 respectively.

(2) *Narain garden.*—The Narain garden is similarly maintained by both Committees. It is in the same condition as last year. The produce realized amounted to Rs. 118 and the expenditure to Rs. 228. In 1882-83 the income was Rs. 134 and the expenditure Rs. 245. It is an ornament to the station, but I doubt whether the expenditure on it and the following is justified.

(3) *The Kutcheri compound garden.*—This garden is maintained totally by the District Committee. The expenditure during the year was Rs. 272, income *nil*. There may be some income when the trees begin to bear fruit, but the garden will never be self-supporting.

(4) *The Nawashahr Baradari garden.*—This garden is managed by the District Committee. It is of old standing and contains many fruit trees. The income from fruits alone was Rs. 197. The total income and expenditure were:—

	Income.	*Expenditure.*	*Surplus.*
	Rs.	Rs.	Rs.
In 1883-84 ...	292 ...	244 ...	48
1882-83 ...	161 ...	240 ...	

Many of the seeds supplied during the year by the Agri-Horticultural gardens, to which a contribution of Rs. 120 is made annually, were bad and did not germinate, specially the imported vegetable seeds. Some seed was consequently purchased from the Rambagh garden at Amritsar.

Establishment.—The following establishment was employed—

The Empress garden.

1 Head gardener @ ... ... Rs. 15 per mensem.
1 Mate... ... ... „ 8 „

8 Coolies @ Rs. 4 per mensem	...	Rs. 32	„
1 Bhisti		„ 4	„
... Total ...		Rs. 59 per mensem=Rs. 708 per annum.	

The Narain garden.

1 gardener	Rs. 3-8-0	per mensem (moiety)
3 coolies...	7	„
Total	Rs. 10-8-0	per mensem=Rs. 126 per annum.

The Kutcheri compound.

1 gardener	Rs. 3-8	per mensem (moiety)
3 coolies...	7	„
Total	Rs. 10-8	per mensem=Rs. 126 per annum.

The Nawashahr Baradari garden.

1 gardener	Rs. 6	per mensem
2 coolies @ Rs. 4 each	„ 8	„
Total	Rs. 14	per mensem=Rs. 168 per annum.

Government plantations on the River side.

1 Darogha	Rs. 15	per mensem
5 Peons @ Rs. 4 each	„ 20	„
Total	Rs. 35	per mensem=Rs. 420 per annum.

The Jullundur Sudder nursery.

1 gardener	Rs. 10	per mensem
1 mate...	5	„
3 coolies	Rs. 11	„
Total	26	per mensem=Rs. 312 per annum

Tahsil Nurseries.

19 coolies @ Rs. 4-8 each ...	Rs. 85-8	per mensem=Rs. 1,026 per annum.
Extra watering Establishment,— 24 Bhistis during the hot weather. 12 ditto. ditto. cold weather. @ Rs. 4-8 p. m. each	Rs. 708	„
Grand total ...	Rs. 3,594	per annum.

The permanent Establishment of *naukar coolies* employed on metalled roads also undertake the duty of planting and taking care of roadside trees.

General supervision of arboricultural operations was entrusted to the tahsil mistris acting under the orders of the Tahsildars.

Financial results.

Income.	Wood.			Fruit.	Plants.	Grass.	Miscellaneous.	Total.
	Lopping.	Thinning.	Dead trees.					
I Ornamental gardens ...	1	...	49	466	96	...	275	887
II Nurseries	...	1	...	191	46	2	71	311
III Avenues and groves ...	11	5	2,782	1	...	498	2	3,299
IV Afforested wastes ...	...	...	...	...	...	...	...	...
	12	6	2,831	658	142	500	348	4,497

Expenditure	A—Working.	B—Establishment.	Total.
I Ornamental gardens	*1,023	1,113	*2,136
II Nurseries ...	1,123	1,369	2,492
III Maintenance and repairs of established avenues	121	1,018	1,139
IV Extension of avenues and groves.	130	94	224
V Afforestation of waste land ...	...	...	
	2,397	3,594	5,991

* Includes Rs. 120 subscription to the Agri-Horticultural gardens.

Deficit Rs. 1,494.

11.—HOSHIARPUR DISTRICT.

General remarks.—The season was one of deficient rainfall, the actual rainfall amounted to 25·1 inches, being 10·77 inches under the average as published in tables circulated by Settlement Commissioner. No progress has to be recorded, the energies of the establishment being solely devoted towards maintaining plantings of previous years.

Thinning and clearing out.—A considerable amount of work has been done in this direction, more especially in the Hoshiarpur parganah, the object being to remove all disfigured, stunted, and inferior description of trees, *siris* and *spinosa phula* a *modesta*, beri zizyphus, numalaria, bakain, melia azaderachta, and others too numerous to detail, which experience shews do not conform to the conditions required of good avenue trees. The clearances effected have been satisfactory in the extreme; large sums have been realized, and it is now possible for the first time to estimate exactly the amount of work which yet remains to be done.

It would be very desirable to have Jamadars or the *personnel*, comprising subordinate supervision, trained men, men who could use their discretion and understand how to lop, prune, and remove superfluous growth from any particular tree. Not one native workman in a hundred knows how to do this, hence the disfigured and mutilated appearance of most of our avenue trees; as is well known permanent disfigurement is not the only result arising from injudicious lopping, the hacked and mangled stump develops not, and premature decay which is communicated to the whole tree.

Description of work.—Under the head of general progress there is, for reasons already noted, nothing to record, and it has been found impossible to effect the reduction of establishment contemplated during the previous year. The effects of the drought were very marked in the destruction of many handsome tun, cedrela tuna and siris in various parts of the district. These succumbed, and their timber after felling was found to be practically useless.

Experimental sowing.—Some carob seed, ceretonia siliqua, were received from Lahore; these were acclimatized seed. They were tried at Mangowal and Hoshiarpur; the directions for sowing and subsequent cultivation which accompanied the consignment were steadily adhered to; not a single seed germinated; it is impossible to account for this failure.

Eucalypti continue to do well; the value of this species is being recognised; constant applications are being made for seed and saplings from nurseries in the district. The people also believe in the efficacy of the leaf as a febrifuge and a tonic; two or three leaves chewed before a meal improve the digestive powers, add a tone to the stomach, and stimulate the appetite, so the natives maintain.

Cho reclamation.—No more experiments have been undertaken, the work now standing completed near the city of Hoshiarpur, testifies to what can be done, and how far limited action on the part of the people, if ever initiated, would answer.

The total mileage of roads in the district amounts to 712 miles, of this length 438 miles are planted out. The tabular statement submitted herewith does not require a return shewing the number of trees existing, planted out during the year, or failures, as the case may be.

Encamping grounds.—The total number of encamping grounds in the district is 23, with an area aggregating 479 acres; of this 399 acres are planted out, no addition being made during the year 1883-84.

Establishment and supervision.—The establishment during 1883-84 consisted of 3 jamadars and 97 malis distributed as follows:—

		Rs.
Hoshiarpur.—1 Jamadar ...	... @	7 p. m.
1 Mali ...	... @	5 p. m.
22 Malis ...	... @	4 p. m.
Garhshankar.—1 Jamadar ...	... @	7 p. m.
22 Malis ...	... @	4 p. m.
Dosuah.—1 Jamadar ...	... @	7 p. m.
2 Malis ...	... @	5 p. m.
4 Do. ...	... @	4/8-p. m.
20 Do. ...	... @	4 p. m.
1 Do. ...	... @	3 p. m.
Una, including Amb.—1 Mali	... @	6 p. m.
2 Do. ...	... @	5 p. m.
20 Do. ...	... @	4 p. m.
1 Do. ...	... @	3 p. m.
1 Do. ...	... @	1 p. m.

This includes the mallis employed on the encamping grounds and station roads.

The total cost of arboricultural operations including temporary establishment employed during May, June and July is Rs. 5,971, and repairs to tools and appliances amounts to Rs. 219.

Supervision was efficiently maintained by the Tahsildars and overseers who have been assisted by the members of sub-committees. The lively and intelligent interest

invariably evinced by native members of the Committees in arboricultural operations, the sound practical advice they can afford on numerous points, and above all things gratuitious assistance, these are all points which render it exceedingly difficult to over-estimate the value of this unpaid agency.

Financial results.—

EXPENDITURE :—

	Hoshiarpur.	Dosuah.	Una.	Garhshankar.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.
Establishment	1,200	1,413	1,200	1,140	4,953
Do. Temporary	125	133	160	259	677
Contingencies	63	37	52	67	219
Total	1,388	1,583	1,412	1,466	5,849

INCOME.

	Hoshiarpur.	Dosuah.	Una.	Garhshankar.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.
By sale of timber	6,842	1,792	73	3,209	11,916
,, Fruits	17	...	...	3	20
,, Kharkana	55	21	49	210	335
,, Lakh	...	3	216	106	325
,, Grass	19	...	5	64	88
Total	6,933	1,816	343	3,592	12,684

These totals do not include income from encamping grounds credited to Provincial revenues, but the following statement gives these figures—

	Hoshiarpur.	Dosuah.	Una.	Garhshankar.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.
By farming land	151	140	307	273	871
,, Sale of timber	95	130	...	187	412
,, Of grass	29	45	52	42	168
Total	275	315	359	502	1,451

The income from both sources amounts to Rs. 14,135, shewing an increase over last year's revenue of Rs. 6,421.

12.—KANGRA DISTRICT.

General remarks.—The year was noted for a scanty rain-fall, both as regards the summer and winter rains, and the effect was naturally very detrimental to the propagation and growth of plants. Endeavours are made to provide for the watering of plants by the entertainment of bhistis, but the nature of the country and the necessarily limited resources at our disposal, render it impossible to make the measures so thorough as to protect the plants from all loss by drought, and we are obliged to restrict the plantings in the dry tracts to such varieties as take easy growth and do not need much water.

Description of work.—The number of road-side trees planted in all the tahsils was 29,083 as compared with 47,379 in the previous year, *viz* :—

		Planted.		Successfully.
(1)	Nurpur	1,108		75 per cent.
(2)	Kangra	579	...	do.
(3)	Palampur	1,104	...	do.
(4)	Hamirpur	5,432	...	50 ,,
(5)	Dera	2,109	...	do. ,,
(6)	Kulu	7,358	...	do.
(7)	Plach	11,693	...	do.
	Total ...	29,083	...	53 per cent.

But it should be explained that the above percentage has been deduced from the state of the trees as it was reported to be at the close of the year, and that they have yet to stand the drought which has ensued in the two last months and which ordinarily destroys nearly half the trees planted from year to year.

The description of the trees planted in the various tahsils has been given in the statement.

Nurseries.—The existing nurseries have been found sufficient for propagation purposes, and there have been no additions during the past year under this head.

Tun, shisham, mango, khirik, jaman, mulberry, siris, &c., are grown in the road-side nurseries in the Nurpur iláká.

The nurseries at Dharamsálá, Jadrangal, and Chari consist of tun, khirik, oi, mulberry, kelu, deodar and Rai seedlings and cuttings.

The last three descriptions are confined to Dharamsálá, where the seedlings have been largely propagated and the nurseries are under the charge of the Kotwal.

The nurseries along the new line of the Mandi and Phagwára roadway have been well stocked with mango, mulberry, simbal (cotton tree), shisham, jaman, &c.

Lopping of roadside trees is effected by means of coolies, but care has been taken to see that the work is done properly.

Establishment and supervision.—There is no regular establishment, and the work is done by coolies temporarily employed under the supervision of the Kotwals and Tahsildars. In Dharmsálá two gardeners on Rs. 5 each and one rákhá on Rs. 5 are entertained, and an allowance of Rs. 10 is given to the Kotwal for supervision.

Malis are entertained at the Sadr on the Mandi and Phagwárá road, at Kulu and Dehra, but it is to be regretted that the funds at the disposal of the Committee do not admit of the employment of a trained agency for arboriculture purposes.

Financial results.—The expenditure, compared with the previous year, was as follows :—

	1883-84. Rs.		1882-83. Rs.
Establishment permanent	192	...	191
Nurseries, seedlings, &c.	512	...	1,201
Road-side trees	466	...	1,080
Total ... Rs.	1,170	... Rs.	2,472

The expenditure on the last two heads had to be reduced in consequence of the demands under other heads.

The receipts from sale of old trees and loppings were Rs. 182-2-7, against Rs. 296 in the year before.

Mr. Dane has obtained satisfactory results from introducing a prize system, according to which the Lambardars are adjudged rewards in proportion to the good work done by them in the cause of arboriculture, and endeavours will be made to stimulate the Lambardars of other parts of the district by similar means.

The Commissioner has recently had occasion to draw my attention to the advisability of relieving the zamindars of the charge of the trees on the Mandi and Phagwárá road in the Hamirpur iláká, and the District Committee have taken steps to effect this, and to arrange for the maintenance of the trees either by contract or by paid labor.

AMRITSAR DIVISION.

Remarks by Commissioner.

A copy of Commissioner's last report (No. 1836, dated the 27th June 1883, to your address) was sent to each Deputy Commissioner for information and guidance, and Commissioner is glad to learn from the district reports now submitted that greater care has been exercised in the lopping of trees and in the transplanting of saplings; also, that increased attention has been paid in the Amritsar and Gurdaspur districts to the introduction of fruit trees into villages, as suggested in my letter above quoted.

The report by Col. Harcourt, Deputy Commissioner of Gurdaspur, is very full and interesting, and shows that he devotes considerable time and attention to arboriculture.

13.—AMRITSAR DISTRICT.

General remarks.—The number of trees planted along roads and fenced was 4,400. Fencing was carried out in accordance with the suggestions of the Conservator of Forests. The trees were two years old when transplanted from the nurseries, in accordance with the suggestions of the Commissioner in his Circular No. 128-1837, dated 27th June 1883. The soil of many parts of the district is not well suited for the growth of trees, owing to the presence of a crust of kankar underneath the surface. As a rule trees flourish and thrive for a few years and then die, as their roots cannot penetrate this crust. Kikar is therefore being sown broadcast along roads where the soil is unsuitable for other trees. The encamping-grounds of this district have a sufficient number of trees of sorts planted round them; efforts are being made to propagate more fruit trees. The most important new works undertaken during the year under review consisted of the planting of single lines of trees along the Tarn Taran-Jandiálá road two miles, Amritsar Civil lines one mile, and the planting of trees in the Kutchery compound. In addition to this, the work of replacing trees all over the district that were destroyed by storms or died from various causes was very heavy. The system of management of the young saplings and their treatment during the process of transplanting are well attended to by Tahsildars, the Darogha, and other officials.

The plantations in the district are fully stocked with young trees of one, two and three years old, raised from seeds and cuttings. The district roads are supplied from these nurseries.

Transplanting takes place during the months of February and July each year. None but good healthy plants are allowed to leave the nurseries. 700 trees were given away in addition to those planted on the roads.

Establishment and supervision.—The establishment is detailed on the reverse of Statement and needs no further comment. The avenues were frequently inspected. It is intended to extend the sadr nursery by incorporating some adjacent nazul land on which only fruit trees will be reared. This subject of planting fruit trees is one of much importance in many ways, and will receive attention in future.

The apathy of zamindars has been a great drawback to the progress of arboricultural operations. With a view to encourage this co-operation, it is proposed to introduce plot planting by zamindars, the plants being issued free of charge. The Tahsildars of the district will no doubt take an interest in this work, and induce zamindars to plant trees in portions of their hitherto uncultivated lands. These plots should be inspected frequently and prizes or parwanas *khushnodi mizáj* awarded to those zamindars who show the best results. The rainfall was fair and the result of the planting satisfactory. The new plants suffer most during the months of May and June from the scorching hot wind, and a good number perish year after year by cold, though in winter they are protected from frost by thatch and grass coverings. A good deal of damage is also caused by cattle trespassing.

Pruning of trees.—The work of lopping and trimming trees has been carried out with care by the ordinary agency, and has proved lucrative. The station gardens and civil lines are under the charge of Municipal Committee, and the district roads, &c., under Tahsildars and a Darogha.

The expenditure for the year under review was Rs. 7,632, contributed from the following sources :—

	Rs.
Provincial fund	1,100
District fund	6,532
	7,632

The total amount realized by sale of dry trees and branches was Rs. 1,568, against Rs. 1,456 realized during the last year.

14.—GURDASPUR DISTRICT.

General remarks.—In my last year's report I detailed generally what was the then condition of the district as regarded arboricultural prospects, and I showed what course I proposed pursuing with a view to secure better results. The scheme I drew up in the matter of revision of the establishment met with the Commissioner's approval, and since then the arboricultural work of the district has been strictly carried out on the lines therein laid down.

On the whole the establishment has worked well. In some places, as must always be the case, more care and attention has been devoted to the work of arboriculture, and in others a proper want of supervision had led to less successful results; but taking a general view, I think I may say the establishment has performed its duty efficiently and has been fairly well supervised by the several Tahsildars.

Description of work.—I had given most careful orders as to loppings, for it is in carelessly seeing to this that so much injury accrues to even well-grown trees. Each jamadar at the head of the Tahsil gang was instructed that he alone was ever to be allowed to lop branches off the young trees planted out, and in every care loppings were to be made with the saw, the use of the axe being altogether prohibited. These orders were understood and acted up to, except in the Pathankot tahsil, where availing himself of the opportunity afforded by a

change of Tahsildars, the gang-jamadar commenced operations on the beautiful Jaman avenue running between Pathankot and Sujanpur, and on my riding by this one morning I found to my dismay that these fine trees had been mangled in the most shocking manner, a perfect forest of branches lying under the trees. Some of these branches were nearly a foot in diameter. Ignorance and presumption had had full sway, and the result was that one of the finest avenues in the district has received most material injury. I made a full euquiry, and the jamadar who distinctly disobeyed orders in using an axe, was relieved of his appointment and will not again obtain service. I at first thought the Tahsildar was to blame, but this was not so. The jamadar said the Tahsildar who had just left had directed him to clear the avenue, and it seems he acted on this order, and the new Tahsildar did not know what was being done till the damage had been effected.

In all the Tahsils trees have been planted out with care along particular road-sides, while when the gangs could be spared from the particular roads they were engaged upon, they have been set to fill in existing deficiencies in trees, and to properly fence in young trees that were left in an unguarded condition.

Planting out on road-side avenues has been attended to, of course, with men who really know very little of arboriculture, and who, for the main, work because if they did not their pay would be cut. One can't expect the happiest results; yet, I think, we have fair cause to congratulate ourselves on the district arboricultural prospects.

The annexed list shows what has been done during this and last year:—

Tahsils.	1882-83.		1883-84.	
	Trees planted on road-side.	Trees planted at other places.	Trees planted on road-side.	Trees planted at other places.
Gurdaspur	1,714	8,224	1,917	6,755
Batala	545	4,145	7,754	49
Pathankot	738	...	1,136	12
Shakargrah	2,820	7,000	1,320	8,600
Total ...	5,817	19,369	12,127	15,416

As to these figures they are supplied to me and I enter them, but I do not accept them as being quite correct. In some instances I am pretty sure they are incorrect. I do not, for instance, believe that in 1882-83, 2,820 trees were planted in Shakargarh on road-sides, or that 7,000 trees were in this tahsil planted in "other places." I have been all over this tahsil and everywhere I went I looked after the arboricultural operations; certainly there has been exaggerations here. Nor in Gurdaspur tahsil in 1882-83 were 8,224 trees planted in "other places." The returns for this year are more reliable, but the Shakargarh statistics I do not credit. The Tahsildar at Shakargarh leaves matters too much to his subordinates, and I do not see where he could possibly have planted the 8,600 trees in "other places."

On the other hand the Pathankot return is understated. Babu Nund Ram is much interested in tree cultivation, and he has taken an active part in planting out. As an instance I may mention the new Pathankot encamping ground, which he has surrounded with fine young mangos, all properly fenced in, together with a straight line of mangoes running up the centre of the encamping ground alongside of a stream of water that bisects the area.

The Tahsildar of Batala also has done good work.

I encourage zamindars to come in and take trees. Each man is entitled to 5 trees (fruit or other sort) free, and the charge for others is merely nominal. I wish to make fruit gardening and tree planting popular, and it is only by a little liberality of this sort that we can hope to do much.

As a rule in this district all trees thrive everywhere. But in parts of Shakargarh tahsil there are considerable stretches where nothing but kikar appears, and with water so far below the surface it is no easy matter in such tracts to secure avenues. But the perseverance of other Deputy Commissioners who have preceded me has overcome difficulties, and where trees have been once planted out and have disappeared, they should with proper care again appear and thrive and be a source of comfort to the traveller.

I said that nearly all trees throve in this district. But curiously enough the nim tree is conspicuous by its absence. I believe there are not more than three nim trees in the district. One of these is in Mr. Sparling's garden at Madhapur, another is at the Dâk Chowki at Gurdaspur, while the third is a traditionary tree; it exists, but I can't ascertain its habitat. I presume the nim is a sort of first cousin to the bakain, and not a very distant relative to the tun. Now both the tun and the bakain grow in abundance in this district, and it seems strange that the nim will not prosper. I understand that the nim is also uncommon in Hoshiarpur district. The Tahsildars tell me, and this has been confirmed by various zaildars,

that efforts to plant out the nim all fail. There is something in the earth or the air or the water of the district which is inimical to this tree.

Financial results.—The expenditure on arboricultural operations for the year under report was less than that reached in 1882-83, and the results have been more successful.

The figures stand thus:—

	1882-83.	1883-84.
	Rs.	Rs.
Station garden establishment	840	840
Arboricultural establishment	832	511
Contingencies as per memo. attached ...	906	1,067
Donation to Government garden, Lahore ...	240	120
Total ...	2,818	2,538

The new scheme I have been working out has given an increased efficiency and a reduction in expenditure.

P. W. ARBORICULTURE.

Maintenance of road-side trees.—The expenditure on this account during the year comes to Rs. 2,990. The establishment maintained during the year stood thus: For Gurdaspur station—1 jemadar and 6 tree care-takers; for each of the 4 tahsils—1 jemadar and 10 tree care-takers.

The sale proceeds of dried and fallen trees amounted to Rs. 1,334, as against Rs. 1,316 in 1882-83.

The list of trees the Conservator of Forests gives in his Progress Report for 1882-83, is a most useful one, and I should be very glad if he could supplement this as occasion requires, for there are several trees growing in this and perhaps peculiar to this and other submontane districts, to which I can find no proper botanical name.

There is a peculiar feature about trees in the Punjab, concerning which I have not yet seen anything in print. In so far as my recollection carries me, it appears that in Europe the new leafing of trees commences with the spring and terminates with the autumn, except in the case of the so-called evergreen species. In the Punjab, however, the new life of the tree and the spring are not conterminous periods with many specimens of trees. I have this year jotted down in a rough diary various notes on the decay and fresh appearance of the leaf on various trees, and I append a statement which shows the result of my investigation. The trees I have referred to are all in my own garden, so that I have been able to observe them with care and attention.

The study of the question may be said to give interesting rather than useful results, though, on the other hand, it would in planting out lines of avenues or parks of trees be always of advantage to know what would be the period of full leaf and leaflessness in the various trees chosen. If, as a general, rule the full leafing of trees is conterminous with the summer months, then we are led to infer that the hill or *safe serus* (acacia elata), the umultas (cassia fistula), the kachnar (bauhinia variegata), chirree phul (erythrina indica), and bahæri (terminalia balerica) came originally from a land where the summer commenced far later than it does in the Punjab.

Of the trees that are bare in the Punjab winter and that releaf themselves in the spring, the shishum is the only one that I have observed which follows the order of nature.

The kachnar is bare of leaves by the end of March, but is then in full flower; by the end of April the flowers have disappeared, and even by the end of May there are very few signs of leaves, these growing scattered over the trees and not coming up universally as in the siris and shishum.

The chirri phul only commences flowering by the end of March, and just as the kachnar flowers are dying out, the chirri phul is resplendent with its beautiful crimson blossoms. Early in May these all disappear, and even by the end of May there is hardly any indication of leaf.

The leaves of the baheri do not begin to decay till the end of March, and by the first week in May the branches are bare. This tree, however, soon picks up again, and by 20th May the fresh leaves are out with the honey-smelling flower, the scent of which pervades the air in the most wonderful manner.

The common siris is, in every sense of the word, a bad tree. It never is in much leaf till the rains, and then its shelter is not required; but it has the one remarkable peculiarity

of no other tree that I know of, that in the hottest nights it is always cool under the siris, while under the shisham and other trees the heat is worse than in the open. The siris, with its myriads of yellow pods, spoils any garden. It becomes denuded of leaves by the end of March, and the fresh shoots do not appear till about the end of April, and by the first week in May all but very old specimens are in full leaf, though they seldom reach perfect maturity till the rains.

The hill or safed siris, which grows to a great height, and would be an ornament to any park, and does not either bear the pods that crowd its plains congener, is in March and April but a collection of leafless branches, nor does it begin to put forth its fresh leaves till the end of May. Thus for about three months this tree is in no way ornamental.

The semal is leafless in March and for half of April, but by the end of that month the fresh leaves have well advanced.

Probably one of the best trees for extensive planting in parks, gardens and avenues, (that is if it would stand planting far from the hills) is a tree locally termed Chouhoutra. This singular tree, two specimens of which are growing near my house and are far from any water supply, is in full leaf till 27th March. In two or three days every leaf turns a most vivid yellow and on the 3rd day, if there is no wind, almost every leaf is lying under the tree. By the 30th March the fresh leaves appear, and by the middle of April the tree is in full leaf.

The umaltas tree is later than are all other trees I have noticed in losing its leaves. Decay does not commence till quite the end of March, and the process goes on right up to the end of May. During the month of May many of these trees are quite bare, and it is clear that the umaltas should find no place on a lawn as its daily dying leaves in April and May make order impossible.

I now touch on some of the evergreens. The pipal retains its leaves till the end of March, and is bare nearly for the whole of April when it rapidly re-clothes itself. It cannot be termed an evergreen, for in April it is leafless, and like the bor its falling leaves are a daily trial to the orderly gardener.

The bor is certainly an evergreen, for it is never without leaves, the majority of which are green, but it begins to drop its leaves in April, and the process goes on for the whole of May.

The jaman is one of the best trees for an avenue, far superior to the bor or even the shisham. It never quite loses its leaves, but for the first three weeks in April, the young leaves appear and push off the old ones. During this period the jaman is not in perfect foliage, but it may be said that for the whole of the rest of the year it is a handsome and shade-giving tree.

The mangoe is a pure evergreen, but it also goes through a process of moulting, its main period of change being May, when its dead leaves show what yearly decay there must be.

The jaman, the shisham and the chouhoutra are probably the three best trees for avenues and for gardens. They nearly always give efficient shade, but there is this against the jaman and chouhoutra being in gardens, that they both lose their leaves rather late.

DETAIL OF CONTINGENCIES.

	Rs.	A.	P.
Value of a cart	46	0	0
Cleaning Civil khal	28	0	0
Rent of water supplied to gardens	129	0	0
Jafri for grapes	208	0	0
Repairs to persian-wheel, houses for bullocks ...	153	0	0
Flower-pots and tinds (earthen buckets)... ...	31	0	0
Bhusa and gram for bullocks	238	0	0
Tools for garden	9	0	0
Vegetable and grain seed &c..	11	0	0
Mats for covering mangoe trees	40	0	0
Seals for branding trees	20	0	0
Cleaning wells	3	0	0
Cart of Brandis forest flora	37	0	0
Cost of mal (rope) for persian-wheel	38	0	0
Miscellaneous	76	0	0
Total ...	1,067	0	0

NAME OF TREES.	27th March.	28, 29th March.	30th March.	20th April.	24th April.	4th May.	10th May.	15th May.	18th May	23rd May.	28th May.
1. KACHNAR.—(Bauhinia variegata.	In full flower, purple marked with lake.	...	...	All the flowers gone, a few signs of leaf.	...	Leafless (seed pods appear before leaf dies).	Leafless, one or two of last year's leaves on.	Stiff, shews very few new leaves.	As on 15th May.	A few fresh leaves but still very bare. There is no general resprouting.	Leaves very slowly coming on.
2. CHIRRI PHUL.—Erythrina Indica.	...	...	Commenced flowering, *i.e.* color began to show.	Is in brillant flower.	Still in flower ...	Hardly a flower left, no signs of leaf.	Leaves beginning to appear.	As above ...	Do. do. ...	A few fresh leaves low down. None on upper branches, there is no general resprouting.	Perfectly bare still on upper branches.
3. BAHERI.—Terminalia Balerica (or Bellerica).	...	...	Still in full leaf, but decay commencing.	Leaves getting very brown and wrinkled, vast number of berries.	Rapidly losing its leaves.	Almost leafless.	...	Fresh leaves and flowers coming on.	Some trees rapidly leafing. Air impregnated with honey-like odour.	Nearly in full leaf & flower.	In full leaf.
4. UMULTASS.—Cassia fistula.	...	...	Do.	Leaves browner and more wrinkled.	...	Leaves falling, tops of trees bare.	Some trees quite bare.	...	Some specimens still retain their leaves, others quite bare.	As on 18th May.	A few fresh leaves yellow flowering has commenced.
5. SHISHAM.—Dalhergia Sissu.	...	...	Leaves still very small. The new leafing began about 20th Mar.	In full leaf ...	...	...	...	...	...	...	...

	27th March.	28, 29th March.	30th March.	20th April.	24th April.	4th May.	10th May.	15th May.	18th May.	19th May.	23rd May.	28th May.
6. HILL or SAFED SIRIS.—(Acacia elata).	...	...	Not yet leafless, rapidly becoming so.	Leaves rapidly disappearing.	Not yet quite leafless.	Almost leafless.	A few old leaves still on.	...	Quite bare, no sign of fresh leaf.	At last shows signs of releafing.	Releafing very gradual.	Fresh leaves progressing.
7. PIPAL.—(Ficus Religiosa).	...	...	Still in full leaf but decay commencing.	Some trees quite bare. No signs of fresh leaves.	...	In some trees fresh leaves well out, others quite bare.	Backward trees coming into full leaf.	...	In full leaf.	...	...	...
8. BOR.—Ficus hengalensis or Indica.	...	...	Still in full leaf but showing signs of decay.	Certain branches leafless. Some leaves dying & fresh sprouts shewing.	...	Leaves turning yellow. Young red shoots in abundance.	Old leaves falling but fresh shoots in abundance.	Losing leaves rapidly.	Trees look quite yellow. Multitude of leaves falling.	...	...	...
9. CHOHOUTRA.—(Botanical name unknown).	...	All leaves still on, but of a most brilliaut yellow. On 29th nearly every leaf lying at foot of trees.	...	In full leaf ...	...	...	...	...	...	...	...	...
10. JAMAN.—(Sizygium jambolanum).	Losing its leaves	Losing its leaves.	Young fruit appeared.	Do. ...	...	...	Flower of jaman still coming on.	...	...	...	...	...
11. KARMARU.—(An acacia—botanical name unknown).	Losing its leaves	...	Leafless.	New leaves coming on.	...	In full foliage and flower.	...	...	...	...	...	...
12. MANGO.—(Mangifera Indica).	...	...	...	Seems unchanged	...	Leaves beginning to decay. Fruit in abundance.	...	...	...	...	...	...
13. POMEGRANATE ...	...	...	...	In full flower & leaf for over a month.	...	Flowers dying out.	Flowers dead. Fruit ripening.	...	...	...	...	...
14. PHULAI.—(Acacia Modesta).	...	...	...	In full leaf and flower.	...	...	...	...	...	...	...	...
15. SEMEL.—(Bombax Malabaricum).	...	...	...	Leafless.	Coming into leaf.	New leaves well advanced.	In full leaf.	...	...	...	...	...
16. COMMON SIRUS.—(Albizzia adoratissima or Acacia speciosa).	...	...	Rapidly becoming leafless.	Fresh shoots appearing. Still very backward.	Do. ...	All but very old trees in full leaf & blossom.	...	...	...	...	...	...

15.—SIALKOTE DISTRICT.

Nurseries.—There was a great scarcity of well grown saplings, those in the nurseries being either too young or overgrown. There are five nurseries on the Amritsar road and two on the Zafferwal-Gurdaspur road, but they have been much neglected; successive sowings were not made and consequently there are now no plants in them suitable for transplanting. A good foundation has, however, now been laid, and this important matter is receiving attention. Orders have been given to divide every nursery into three parts, each part to be sown successively every year, so that there shall always be two or three years plants available; besides these there will be kept up small nurseries at every Tahsil garden and at each encamping ground with wells; where the soil is suitable and can be spared. At the Dhira Sunda nursery on the Amritsar road there are a number of seedlings which will be fit to take up during the ensuing rainy season. Sowings have also been made at Talwandi nursery, and the ground at other nurseries is under preparation for sowing after the first fall of rain.

Fencing and protection of young trees.—Young trees on road-sides are protected by a fencing of thorn bushes, or Euphorbia planted round them, and during the winter tender plants, mangoes &c., are covered over with sugarcane leaves, rice, straw or munj grass, as a protection against frost.

Trees planted.—The trees chiefly planted in avenues on district road-sides are those which thrive best without much care or expense, *viz*: shisham, siris, and in some parts mulberry. On station roads, where greater care and attention can be given, mangoes and other fruit-bearing and useful trees have been planted. Tun, sembal, and eucalyptus grow well in the Bajwat tracts across the Chenab river. Some of the roads in the district have double lines of trees on either side, but the generality have only single lines.

Tree lopping.—More care has been taken in the lopping and trimming of trees than heretofore, indiscriminate chopping-off of branches has not been permitted. The work has been done under the direction of the Superintendent of arboriculture, assisted by malis instructed in the mode of lopping the trees. Carpenters have not been left to themselves, and they are allowed to use nothing but the saw; they have also been instructed to make a cut below the branch to be taken off so as to avoid tearing off the bark which used to be so common before. Tahsildars, Zaildars and Lambardars have also exercised supervision during the operation, and the District officers have inspected the work during their tours. Neglect of instructions on the part of the establishment has been punished.

Operations of the year.—No new lines were planted. Blanks in avenues of previous years, were filled up as far as possible. Some of these blank spaces were extensive and some required only a few trees. On some of the spare land of the Talwandi nursery a grove of 200 good mango trees has been planted, 400 mangoes were also put down in the abandoned encamping ground at Dhamthal, where there were already about 800 planted in the previous year.

Work for future years.—The principal work to be done in future years is the maintenance of existing avenues and groves, planting trees where they have failed or in place of those which have perished from the effects of storms &c., and the maintenance of the district nurseries, which should always afford a sufficient supply of two or three-year-old plants.

Ornamental gardens.—The station garden has been well looked after, new varieties of trees have been planted, and it is being gradually filled up with good varieties of fruit trees. The grafted Bombay mangoes planted four years ago have this year produced a good crop of fine fruit. The nurseries have been extended, and a large supply of grafted fruit trees is always kept up for sale and distribution. There were many applications from the people of the district this year, for English vegetable seed and young fruit trees and flowering plants. A number of mango and other trees were supplied for the Cantonment roads on payment. The garden is self-supporting.

Tahsil gardens.—Gardens are kept up at each of the outlying tahsils, and a small portion of each has been set apart as a nursery of fruit and other trees for distribution in the Tahsil and road-side.

Groves.—The plantations at the Kaluwal, Dhamthal and Dharmkote encamping grounds are in a thriving condition and being extended annually.

Progress report.—The prescribed form of progress report, carefully filled in, is herewith forwarded.

Establishment.—The following establishment was kept up during the year.

FOR ROAD-SIDE AVENUES.

	Rs.
A Superintendent of arboriculture	295
6 Malis @ Rs. 5 p. m.	325
41 Bhistis @ Rs. 4 p. m.	1,705
1 Mali on the Karlup embankment	60
1 do. on groves at the site of the Gulushah fair...	48
Rs.	2,433

Brought forward ...	....	2,433
AT NURSERIES.		
5 Malis	...	225
At encamping grounds 4 malis	...	216
Total ...	Rs.	2,874

Financial results.—The financial results of arboriculture operations for the past year are good, there has been a net surplus of Rs. 1,172. A statement in the form proposed by the Conservator of Forest in last year's report is attached, giving all the necessary information regarding receipts and expenditure in the various branches of arboriculture.

LAHORE DIVISION.

Remarks by Commissioner.

The work in the Lahore district during the year consisted of three miles of avenues being added to pre-existing lengths, and some 2,000 saplings being planted in gaps. A small nursery was also opened. In Gujranwala also the operations were limited, and did not go much beyond making good the failures during the preceding year. Avenues previously planted were successfully tended, and 250 trees were planted on the Wazirabad encamping ground, and are said to be a success. The Deputy Commissioner explains that the 3,400 trees planted during the year to make good failures of the previous year have not been shown in the Return. In regard to the operations of the year the Firozpur report is more reassuring, and the local authorities seem very hopeful of continued success.

This is no doubt due to the almost never-failing source of water-supply, and to there being a special officer in charge of arboriculture who takes a particular interest in the subject.

The Nawab of Mamdot seems to have evinced much interest in tree-planting, as he has succeeded in rearing about 50,000 trees on his canals and other places in his Jagir.

16.—LAHORE DISTRICT.

General remarks.—I now proceed to notice the work performed during the past year, and the general condition of arboriculture in the district.

The rain-fall was less than in the preceding year, as will be seen from the following table in which the fall in each tahsil during the past 3 years is compared:—

Tahsil.	1881-82.	1882-83.	1883-84.
Lahore	20·3	33·8	19·6
Kasur	17·2	18·0	14·2
Chunian	18·0	14·5	25·6
Sharakpur	17·5	23·5	20·0
Average Lahore District...	18·2	22·4	19·8

Although the rains were unseasonable, as they held off till very late, the year was, on the whole, not an unfavorable one for arboricultural operations.

No calamitous events affecting arboriculture occurred, and it is satisfactory therefore that no extensive injury from storms, hail, frost or fire has to be chronicled. A severe hail-storm occurred in the Chunian tahsil on the 14th March, 1884, which destroyed or greatly injured the standing crops in some 30 villages, but it did no harm to trees. In most parts of the district white-ants are a great pest, but no complaints have reached me of their having destroyed young or living plants.

It cannot be said that in this district arboriculture is in a flourishing state. Though it is true that Lahore contains a great number of rakhs and not a few excellent road-side avenues and many good gardens, yet, notwithstanding the advantages of water-supply which it possesses in its canals and numerous wells, over other districts, it must be admitted that it is poor in arboriculture. Large tracts may be seen without a tree. Undoubtedly vast improvements have been made here as well as elsewhere since Sikh times, but there still remains great room for further improvement. During the year under report three miles of avenue have been added to pre-existing lengths, and some 2,000 saplings planted in gaps, as also a small nursery opened. This is in brief the result of the year's exertions of the

District Committee, Municipal Committees, and the Tahsildars, to whom the Deputy Commissioner has mainly to look to extend arboriculture, and it is not much. Judging from past experience, it seems hopeless to expect from local bodies and Tahsildars more than the extension and maintenance of road-side avenues and groves for the convenience of travellers. If village communities could be induced to plant groves and preserves on the bare tracts of land lying on all sides of their villages, and if land-holders could be induced to plant trees to mark field boundaries, we should have Lahore in the next 20 years a thickly, wooded district, apart from the favourable effect so much vegetation would have on the temperature and rainfall, it would bring down to an appreciable degree the present high price of fuel.

Planting avenues, filling-up gaps, and tending the young plants put down in previous years was the chief work of the district arboricultural establishment during the year.

A total length of 3 miles of avenue was added to the roads in the district, as compared with 8 miles added in 1882-83, and 2,054 saplings were put down in the gaps in previously planted avenues caused by trees being blown down and by deaths.

The above, however, does not include tree planting operations carried on within Municipal limits by Municipalities. Their operations are shown separately in returns submitted. The amount of work done as far as the figures go compares unfavorably with the results obtained in the preceding year, but this falling-off has not been noticed in the reports received from Tahsildars. From my observations in camp I think a fair amount of attention has been given by Tahsildars to road-side tree planting. The Tahsildar of Chunian appeared to have done a good deal in this way. From the returns, however, it would appear that the establishment in all 4 tahsils were almost exclusively employed in filling up gaps in existing avenues and tending and watering the young plants put down in lengths added during the previous year. It is not necessary to recapitulate here the work done in each tahsil, as the statements which accompany show in great detail the whole operations of the year. From the avenue progress statement it would appear that about 4/5ths of the roads in the district yet remain to be planted with avenues. I am inclined to believe that the proportion is greater. It is hopeless of course to expect that the whole length of all district roads will eventually have avenues planted on them, for there are two almost insuperable obstacles to tree planting being carried on successfully on many of the district roads,—1st, the soil is bad; and 2nd, water is not available. In view to a more systematic plan of operation in future I have given orders for the preparation of a plan, for each tahsil, to show all the roads and parts of roads on which trees have been planted, the lengths on which, owing to the nature of the soil and scarcity of water, it is hopeless to raise shade-giving trees, and the localities where groves for the convenience of travellers have been and can usefully be planted. One copy of these plans will be kept in the District office and another at the tahsil, and will serve as a guide to both the Deputy Commissioner and Tahsildars in directing the operations for the year.

Nurseries.—A small nursery to accommodate 1000 plants was established during the year in Badò on the Sharakpur-Rajghat road in the Lahore tahsil. The plantings are reported to be flourishing.

No other new nurseries were opened. The Tahsildar obtains his supplies from the Anarkalli gardens and also from the tahsil garden. The Tahsildar of Chunian gets his supplies chiefly from Rakh Changa Manga. In Sharakpur the tahsil garden and a small nursery near Mangtanwala supply all requirements. The tahsil garden at Kasur is the source of supply in that tahsil.

Establishment and supervision.—The sub-overseer at each of the tahsils supervises directly all planting operations, in addition to performing his own duties. The following is an abstract of the detailed statement of establishment employed, and their cost during 1883-84 :—

Tahsil.	Establishment.	Cost.		
		Rs.	A.	P.
Lahore	6 men	353	1	0
Chunian...	10 „	453	1	0
Kasur	9 „	453	3	0
Sharakpur	11 „	476	3	0
Total 1883-84	36 men	1,735	8	0

Reference to the detailed statement of expenditure will show that out of a total of Rs. 2,383 expended during the year, so much as Rs. 1,735-8 were paid to the establishment alone.

Financial results.—In the following table the income and expenditure for the year is compared :—

Tahsil.	Income.			Expenditure.		
	Rs.	A.	P.	Rs.	A.	P.
Lahore	192	15	0	533	12	3
Kasur	145	12	6	518	1	3
Chunian... ...	94	14	0	631	15	6
Sharakpur ...	55	9	6	700	0	0
Total ...	489	3	0	2,383	13	0

It will be seen that the expenditure has exceeded the income (as usual) by Rs. 1,894-10.

Statement showing the number of trees planted on Civil Station roads during 1883-84.

Number.	Name of roads.	Fresh Trees.			Shisham, &c.			Remarks.
		No. of plants planted.	No. of plants grown.	No. of plants died.	No. of plants planted.	No. of plants grown.	No. of plants died.	
	MacLeod road ...	...	...	...	200	200	5	8,000
	Railway do. ...	...	...	...	10	10	...	7,000
	Abbot do. ...	...	...	...	20	20	3	3,000
	Nisbet do. ...	...	...	...	40	40	4	3,360
	Victoria do. ...	...	...	...	10	10	1	7,500
	Brandreth do. ...	...	...	...	61	61	4	3,600
	Lahore do. ...	...	...	...	20	20	2	2,000
	Bahawalpore do. ...	...	...	...	30	30	1	7,000
	Lytton do. ...	...	...	...	20	20	4	5,000
	Ferozepore do. ...	...	...	...	40	40	2	5,200
	Church do. ...	...	...	...	2	2	...	1,500
	Upper Mall	...	...	...	40	40	4	7,800
	Lower Mall	...	...	...	50	50	9	3,000
		...	...	...	543	543	39	The cost of these trees including carriage, digging, and earthen pots, is Rs. 113-4-0.

Statement of trees planted in the Minor Municipalities of the Lahore District during 1883-84.

Name of Road.	Number of trees planted during 1883-84.	Number of trees that died.	Number of trees that are still standing.	Amount of Expenditure.	Remarks.
		Kasur.		Rs. A. P.	
Road from Lahori gate to Railway Station ...	725	100	625		The Municipal Committee of Kasur have succeeded in planting a great many trees at a very small cost.
Do from School to Raiwind Road	222	150	72		
Do Do to Gumbaz	466	200	266		
Do from Mori gate to Policewala	63	...	63		
Do from Mianwala gate to Takia Barut Shah,	385	300	85		
From Diwan Khana Kacha road to Gameli road,	223	200	23		
Road opposite the Kucheri-Gumbaz	8	...	8	43-15-0	
Total ...	2,092	950	1,142	43-15-0	
		Chunian.			
Circular Road	200	70	130	...	
		Khudian			
Ditto	80	30	50	...	
		Sharakpur.			
Ditto	192	...	192	19-0-6	
Grand Total	2,564	1,050	1,514	...	

Statement of Avenues, &c., planted in the Lahore District during 1883-84.

1	2	3	4	5	6	7	8	9	10	11
Tahsil.	Rainfall.		Locality or name of road.	Length of road or area.					Species of trees planted.	Remarks.
				Planted.			Un-planted.	Total length of road.		
	Average.	During the year.		In previous year.	During the year.	Total.				
Lahore ...	...	19·6	Road from Lahore to Hariki.	6 miles...	...	6 miles...	12 miles...	18 miles...	Shisham, kikar and rehru.	No addition was made to the length of the avenue on this road during the year: only 200 trees were planted in place of those that died. Rs. 118-9-0 were spent on account of pay of a chowkidar or mohafiz.
	...	...	From Mian Mir to Chabil.	5 miles...	...	5 miles...	...	5 miles...	Shisham and kikar...	1,200 trees were planted in filling up blanks, and in making the avenue thicker, as trees had previously been put down too far apart: of these, 1,000 were raised from seed; 600 died, the remaining plantlings are flourishing. Only Rs. 60 were spent, and that on account pay of a mohafiz.
	...	...	From Raj Ghat to Sharakpur.	2 miles...	½ mile ...	2½ miles...	5½ miles...	8 miles...	Shisham, tun, tut, jaman and dharek.	Half a mile more of this road was planted during the year—200 trees, each at a distance of 20 feet, being put down; 200 more were put down in gaps. The total expenditure on this road amounted to Rs. 347-4-3, as detailed below:—
										Rs. A. P. 1 Bhisti ... ... 60 0 0 2 Mohafiz ... ... 114 8 0 Cost of 400 trees ... ... 30 0 0 Cost of well-water ... ... 77 12 3 Cost of Qulabas ... ... 25 0 0 Total ... 307 4 3
Kasur ...	...	14·2	Road from Gunda Singhwala to Khudian.	6½ miles...	...	6½ miles...	7 miles...	13½ miles	Shisham ...	No young trees were planted during the year on this road which has large shady trees on each side almost the whole way: only those previously planted were watered. Rs. 276-13-0 were spent on the establishment, *viz.*, 4 bhistis and 1 mohafiz.
	...	...	From Khem Karan to Kasur.	6 miles...	...	6 miles...	...	6 miles...	Shisham and farash ...	No new trees were planted, but Rs. 167-15-6 were spent on watering previous years plantings as detailed below: Rs. A. P. 2 Bhistis ... ... 108 0 0 Canal water ... ... 34 11 6 Repairs to nali ... ... 22 4 0 Miscellaneous ... ... 3 0 0 Total ... 167 15 6
	...	...	From Gunda Singhwala to Sur Singh.	2 miles...	...	2 miles...	27 miles...	29 miles...	Kikar, &c. ...	Difficult to rear trees on this road: none were planted and nothing was spent during the year.

	...	...	From Khem Karan to Patti ...	2 miles...	1 mile ...	3 miles...	18 miles...	21 miles...	Shisham, tun, &c. ...	1,500 more trees at distance of 10 feet apart were planted on both sides of this road, 300 being planted in place of those dead. The expenditure amounted to Rs. 187-3-0 as follows:— Rs. A. P. 1 Bhisti } ... ... 70 0 0 1 Mohafiz } Cost of Canal-water ... ... 34 6 6 Planting operations ... ... 75 8 0 Miscellaneous ... ... 7 4 6 Total ... 187 3 0
Chunnian ...	...	25-6	Road from Chunian to Veram.	9 miles...	¼ mile ...	9¼ miles...	9¾ miles...	19 miles...	Shisham, kjkar, shrin and farash.	300 trees were planted on both sides of the road at a distance of 10 feet apart, and the following was the expenditure:— Rs. A. P. 1 Mohafiz ... ... 55 0 0 1 Bhisti ... ... 132 0 0 Digging pits ... ... 10 0 0 Total ... 197 0 0
	...	...	From Chunian to Van Radha Ram.	1 mile ...	...	1 mile ...	13 miles...	14 miles...	Shisham and farash	Rs. 48 were spent in watering trees planted in previous years on this road. Rs. A. P. 1 Bhisti ... ... 44 0 0 Digging pits ... ... 4 0 0 Total ... 48 0 0
	...	...	From Chunian to Kanganpur.	3 miles...	...	3 miles...	13 miles...	16 miles...	Ditto ...	This road passes through a sandy tract, Rs. 134-3-6 were spent as below in maintenance only:— Rs. A. P. 1 Mohafiz ... ... 55 0 0 2 Bhistis ... ... 79 3 6 Total ... 134 3 6
	...	...	From Chunian to Bhai Pheru.	2¼ miles...	¼ mile ...	2½ miles...	15½ miles	18 miles...	Ditto ...	500 trees were planted on both sides of this road at a distance of 10 feet apart: 200 died; expenditure was as follows:— Rs. A. P. 2 Bhistis ... ... 88 0 0 Cost of Canal water ... ... 39 15 9 Digging pits ... ... 6 0 0 Total ... 133 15 9
	...	...	From Chunian to Dhukku.	1 mile ...	...	1 mile ...	8 miles...	9 miles...	Shisham, kikar and farash.	The soil of this road is bad and consequently no more trees have been planted along it.
	...	...	From Holla to Now Theh.	¼ mile ...	...	¼ mile ...	23¾ miles	24 miles...	Ditto ...	Do. do. do.
	...	...	From Chunian to Changa Manga.	9 miles...	...	9 miles...	...	9 miles...	Ditto ...	There is a continuous line of avenue on both sides of this road. Rs. 4-14-0 only were spent in lopping.
Sharakpur ...	...	20-0	Road from Raj Ghat to Bhuchoki.	13 miles...	...	13 miles...	29 miles...	42 miles...	Shisham, siris and jaman.	Only 104 trees were planted in gaps on the road during the year.
	...	...	From Sharakpur to Shekhupura.	2 miles...	...	2 miles...	13 miles...	15 miles...	Shisham and siris ...	No new trees were planted on this road: trees planted in previous years were watered only.
	...	...	From Sharakpur to Gogga.	2 miles...	...	2 miles...	8 miles...	10 miles...	Ditto ...	Do. do. do. The total expenditure on tree planting operations in this tahsil amounted to Rs. 700.

17.—FEROZEPORE DISTRICT.

Expenditure.—Out of Rs. 7,164, Rs. 7,129 were expended, as per accompanying statement of Income and Expenditure.

Income.—The same statement also shews an income of Rs. 1,508-9-6 during the year, and as the income for 1882-83 was not shown in the report for that year, it may not be out of place to state here that Rs. 8,089 were carried to the credit of the General Local Fund during the year ending 31st March 1883, as proceeds from sale of old and matured trees and the trimmings of other trees, and the reason of the great difference between the income of 1882-83 and that of the year under report is that, after inspecting the avenues and groves of the district, Colonel Grey, the then Deputy Commissioner, found it necessary to sell such old and matured trees as marred the progress of the younger plants, as well as to lop off the branches of other trees; hence an income of Rs. 8,089 was derived, and perhaps after another few years it may again be found necessary to repeat the same process with advantage, as the present condition of the avenues and groves show a tendency towards increase.

Description of work.—This year an order has been received to prepare the annual statement in different forms than those used hithertofore, and the result shewn is that 49,800 new trees have been planted during the year, whereof 5,337 have died, *i.e.*, little more than 10 per cent. have perished, against 22·76 per cent. that died last year. Of the total number, *i.e.*, 49,800, as many as 35,075 were planted alongside the roads of the district, and 14,725 elsewhere; thus the average per cent. of the trees that have been reared up successfully is a little less than 90 per cent., and this result is about the best that has ever been known in this district; and I here beg to remark that the above state of things may well be attributed to the tact and energy that Darogha Mahomed Yusaf has shewn in looking after the arboriculture of the district. Independent of the number shown in the annual statements a large number of trees have been grown successfully by the zamindars on the canals who own the land through which the district canals pass, and efforts are being made to encourage the plantation of trees alongside the irrigation canals, where large results are gained with comparatively little or no labor; but, of course, these trees are, and will be, the property of the zamindars on whose land they stand.

The Nawab of Mamdot, who owns a few canals under my charge in this district, has also succeeded in rearing up about 50,000 trees alongside of his canals and other places in his ilaka.

Mode of planting trees.—The same old plan has been adhered to in planting new trees, that is, a portion of a road at a time was first planted by a certain number of bhistis, and a diary is received by me through the Darogha from the four jamadars (one in each tahsil), shewing how many trees have died within the line of a certain bhisti out of whose pay one anna is deducted for every tree of one year old, *if* it is proved that the young plant has died through his neglect, and thus the bhistis are made to take more interest in the growth of their trees than they otherwise would. Since the introduction of the district canals, the kikar tree has grown everywhere in abundance, and usually shisham and farash thrive very well.

Finally, I must not forget to add that the experience of every year tells me that but for the inundation canals perhaps not half the number of the trees planted would have survived.

18.—GUJRANWALA DISTRICT.

General remarks.—The rainfall was below the average and was somewhat unequally distributed, and was not, it is said, owing to lateness, very favorable for tree planting. No calamitous events, however, occurred. Some damage, as might have been expected, appears to have been done by sheep, goats and cattle, to the young trees away from immediate supervision. Some trees are reported to have failed for want of water. It seems apparently difficult to provide means of supplying water, under the existing arrangement, to the young trees which are not within easy reach of wells away from the road-sides, except at considerable cost. As regards damage caused by cattle, the evil could be easily put a stop to by taking vigorous measures for the prosecution of owners who allow their cattle to trespass and destroy the avenues on road-sides.

Description of work.—No roads were newly planted out with trees. The operations of the year were confined to the maintenance and tending of avenues previously planted, and to the replenishment of gaps and blanks where required. The following is a brief description of the year's operations as regards the filling up of gaps on the principal roads of the district:—

1.	Gujranwala and Hafizabad road	...	About 1,300 trees were planted out in miles 3, 23 and 24. A few trees are reported to have failed.
2.	Gujranwala and Rámnagar road	...	300 trees were planted. All are reported to be successful.
3.	Gujranwala and Batala road	...	300 trees were planted. All are reported to be successful.
4.	Gujranwala and Shekhupura road	...	600 trees were planted. All are thriving.
5.	Gujranwala and Amritsar road	...	500 trees were planted, which are in good condition.
6.	Gujranwala and Sialkot road	...	90 trees were planted. All successful.

250 trees planted in the Wazirabad encamping ground, which are reported to be a success. Thus it will be seen that the number of trees planted during the year, to make good failures of previous year, was only about 3,400, which have not been shown in the return. In the civil station the casualties during the year were again large, but not quite as large as in the preceding year. The number which died out in the year previous was 125; in that just ended 101.

The trees which suffered most were, as before, young tallis and siris of from 12 to 15 years growth, and although frequently examined, no defect in the soil, injury to the roots, barking of the trunk, or other cause of destruction could be made out.

Nurseries, &c.—Something was done during the year in the way of raising nurseries for planting avenues on road-sides.

In Gujranwala tahsil nurseries were established at convenient distances from the roads in 12 villages for which Rs. 70 were paid from District funds to the zemindars, and the balance due will be paid when the trees are ready for transplanting.

In Hafizabad tahsil 9 nurseries were raised on the same terms, the cost amounted to Rs. 75. Rs. 50 were paid to Dr. Quinnell and Rs. 100 to Mr. Wild for raising nurseries under their supervision at the sadr station. Several beds containing a large stock of jamuns, mangos and mulberries, which were sown last spring will now be available for planting out during the ensuing rains, and will be used almost exclusively to fill vacancies along all the roads in the station instead of the talli and siris as hitherto. The number of vacancies filled last year was 522; during the year under review 990. It may also be hoped that with a sufficient stock of trees, a systematic plan of fostering arboriculture may be adopted by taking up each main road separately where avenues are still wanting and where the soil is well adapted for the growth of trees. It is my intention to form a standing sub-committee of arboriculture, consisting of intelligent members who really take much interest in arboriculture, as soon as the local boards are constituted and enter on the duties of their office. The scheme proposed for adoption on the Gurdaspur plan will no doubt necessitate revision of the present establishment which, there is reason to believe, do comparatively little work for want of proper supervision.

Method of planting.—The seedlings of one year's growth are taken out with their roots from the nurseries for transplanting, and are protected by a fence of thorn bushes. The bhistis have orders to water every third day till they do not attain sufficient height. The following species of trees are planted out in this district:—Shisham, siris, mulberry, dharek, kikar, phulah, pharwan and ber. Efforts will also be made to plant fruit trees.

Lopping.—Lopping is done with the saw by daily labour, under the immediate supervision of jamadars. The chopping off of branches with the axe has been strictly prohibited. Lopping was done to a less extent this year; the income shown in the statement is partly on account of last year's lopping, which was not credited in that year's account.

Rare plants and trees.—None were received during the year for experimental cultivation. Of the six plants of the "Australian salt bush," described in last year's report, three fruited at the end of this winter, and have yielded a small crop of seed which is now being sown, and will help to extend further the experiments connected with its cultivation.

Establishment and supervision.—The following establishment was kept up to water and look after the trees on each of the roads.

Gujranwala and Hafizabad road ...	11 bhistis on Rs. 4 per mensem each.
Gujranwala and Ramnagar road ...	4 do. „ „
Gujranwala and Batala road ...	2 do. „ „
Gujranwala and Shekhupura road ...	12 do. „ „
Gujranwala and Amritsar road ...	8 do. „ „
Gujranwala and Sialkot road ...	1 Watchman on Rs. 5 per mensem.
Gujranwala and Rhiali road	2 Bhistis on Rs. 4 per mensem each.
For the above roads	2 Jamadars on Rs. 10 per mensem each.
Station roads	6 Bhistis on Rs. 4-8-0 per mensem each. 1 Mate (allowance) Rs. 1-8-0 per mensem.
Abiana for watering trees round Kuchery,	Rs. 4 per mensem.
Sarai Ghakhar ...	1 Bhisti on Rs. 4 per mensem.
Dâk bungalow, Wazirabad ...	1 do. „ 2 „
Encamping-ground, Wazirabad ...	1 do. „ 4 „
Hafizabad garden ...	1 gardener on Rs. 6 per mensem. 1 coolie on Rs. 4 per mensem.
Mutteke rest-house	1 Bhisti on Rs. 4 „
Sarai Pindi Bhattian	1 Bhisti on Re. 1 „

	Rs.
Total cost of establishment ...	2,528
Planting nursery	295
Miscellaneous charges ...	61
Grand Total ...	Rs. 2,884

The supervision at present seems defective, and will be improved when the establishment is revised.

Financial results.—The expenditure was Rs. 2,884 against Rs. 3,498, or Rs. 614 less, while the income from the sale proceeds of loppings amounted to Rs. 495. The expenditure was Rs. 2,389. The above is exclusive of receipt and expenditure on account of station gardens.

RAWALPINDI DIVISION.

19.—RAWALPINDI DISTRICT.

General remarks.—The rainfall was above the average, but, as usual, the quantity varied a good deal in the different tahsils, the rain being more abundant in tracts near the Hills.

Description of work.—On 62 roads trees were planted, either in extending avenues, or in filling up gaps and forming clumps.

The following table shows the number of miles on which trees were planted in each tahsil:—

Tahsil.	Number of miles on which trees were planted.	Number of trees planted.	Number died.
Rawalpindi	20	3,121	1,640
Attock	4	4,124	1,370
Pindigheb	4	3,011	528
Futtehjang	12	16,985	486
Gujarkhan	50	35,314	2,259
Kahuta	30	22,911	989
Total ...	120	85,466	7,272

Planting generally successful.—The number of trees planted in the tahsils of Futtehjang, Gujarkhan and Kahuta was large, and the planting was successful.

Capabilities of different tahsils for tree planting.—The difficulties attending the successful planting of trees in avenues on the roads in this district generally have been explained in the report on arboriculture for the year 1882-83.

The only tahsil in which arboricultural operations can be carried on with advantageous results is that of Kahuta, the climate, soil, and rainfall being well suited to tree planting.

The Rawalpindi tahsil is an average one for tree planting. In the Attock tahsil only in the Chach and Huzro ilaqas, and in the Fattehjang tahsil only in ilaqa Sohan, can trees be propagated without difficulty.

In the Gujarkhan tahsil, though the rainfall is sufficient, the soil is not suited for tree planting, and the only tree that thrives is the kikar.

In the Pindigheb tahsil the rainfall is scanty, climate hot, and ground hard. The ber and phulai only thrive here.

Considering the nature of the soil and climate in the several tahsils, the number of trees planted may be considered satisfactory.

Species of trees planted.—The trees planted were shisham, mulberry, phulai, kikar, bakain, kahu (wild olive) and ber.

Clumps of trees.—Besides the roads on which trees have been planted in the several tahsils as exhibited in the progress statement, there are 110 clumps, namely—:

Tahsil Rawalpindi	26
„ Attock	20
„ Pindigheb	12
„ Futtehjang	16
„ Gujarkhan	27
„ Kahuta	9
Total ...	110

The total acreage under these groves is 29 acres.

Trees planted elsewhere than on roads.—In addition to the trees planted on roads during the year, there were 5,458 trees planted elsewhere in clumps, in nurseries, and in public gardens.

Trees planted in Municipalities.—In the several Municipalities of the district a larg number of trees were successfully planted : at Rawalpindi, only 40 failed out of 2,439 tree planted. In other Municipalities 606 were planted, out of which 89 died.

By Zemindars.—Trees have been extensively planted by zemindars at wells and tanks and musjids.

Propagation of fruit trees.—Attention continues to be given to the propagation of fruit trees also.

Public gardens.—There are the following public gardens :—

1. Rawalpindi.
2. Chattar.
3. Hasan Abdal.
4. Futtehjang.
5. Pindigheb.
6. Gujarkhan.

Nurseries.—Nurseries of fruit trees for supply to the public are maintained in Rawalpindi and Chattar gardens.

Chattar and Rawalpindi gardens.—The garden at Chattar, which is situated on the Rawalpindi and Murree road, has a good climate, good soil, and an abundant supply of water from a hill stream.

The garden at Rawalpindi is situated on the bank of the Leh river. It has extensive grounds well laid out and with a good supply of water. It is maintained at an average annual outlay of Rs. 4,000.

Both the Chattar and Rawalpindi gardens are well stocked with fruit trees.

Fruit trees obtained from Botanical gardens.—During the year young fruit trees were obtained from the Botanical gardens at Saharanpore, Amritsar and Lahore, at a cost of Rs. 585 for the public gardens.

Cultivation of fruit trees by landed proprietors.—The landed proprietors are beginning to take an interest in the cultivation of fruit trees ; and during the year trees were distributed to villages where fruit trees had never been previously planted.

Supervision.—The tree planting is carried on though the agency of zemindars and under the direct management of Tahsildars. The work is generally supervised by the Tahsildars, assisted by the tahsil overseers.

Financial results.—The total expenditure on the planting of forest trees, propagation of fruit trees, and maintenance of the public gardens, amounted during the year to Rs. 5,943. There was only a small income from loppings of trees, which amounted to Rs. 97.

20.—JHELAM DISTRICT.

General remarks.—The year under report being more favorable for operations than the one preceding, there was a much greater number of trees planted. The plants other than the fruit trees were obtained from Beli Piraghaib ; the fruit plants and cuttings were obtained from the Station gardens.

Description of work.—The plantations on the road sides within the limits of Jhelam Tahsil consisted of sissu trees ; 2,250 were planted, of which 400 died during the year, and the remaining are thriving. About 190 trees were planted in different localities, of which 50 died during the year.

Of the 550 trees planted on the road sides in Pind Dadun Khan tahsil 50 died during the year. The total number of trees planted in Chakwal tahsil was 150, all of which are thriving.

In Talagang the result with regard to the trees planted is the same as in Chakwal ; all the trees planted, 520 in number, are flourishing. 80 trees were planted at the Tank at Talagang ; these are also in a thriving condition.

About 9,254 cuttings of fruit trees were planted in the Jhelam Station gardens ; of this number 1000 died. At Sheikhupura 120 trees were planted—53 were sissu trees and the remaining fruit trees ; these are all flourishing. At Sarjalal Khan 86 trees were planted—40 sissu trees and 46 fruit trees ; none of these have died. 87 sissu trees were put down at Sohawa ; these are also thriving. In Pind Dadan Khan tahsil the total number of trees planted was 900, of which 400 have died.

Chakwal	...	...	1,619 trees planted ; 352 died.
Talagang	...	...	400 planted ; 100 died.

In about 1 kanal of land at Talagang seeds were put down ; 1000 plants germainted, but 400 died during the year.

Three new plantations were laid out during the year at Sheikhupura, Sarjalal Khan, and Sohawa.

About 15 per cent. of the cuttings and plants put down failed, principally from the attack of white ants.

Establishment and supervision.—The Establishment remains as usual, details are given in the annexed table :—

Tahsil.	Place where employed.	Detail of Establishment.						Rate of pay of each.					
		Gardeners.	Coolies.	Bhisties.	Pakhalias.	Mates.	Jemadars.	Gardeners.	Coolies.	Bhisties.	Pakhalias.	Mates.	Jemadars.
Jhelam ...	Garden	2	6	2	4	...	...	20-7	5	5	5	...	...
	Nurseries	...	5	...	...	...	1	...	5	...	...	...	10
	Plantations	...	5	...	...	1	...	...	5	...	...	7	...
P. D. Khan ...	Garden	1	3	...	...	...	...	15	5	...	...	...	...
	Nurseries	...	7	...	...	1	...	...	5	...	...	5	...
	Plantations	...	3	...	...	...	...	...	4	...	...	...	...
Chakwal ...	Garden	1	1	1	...	...	...	10	5	5	...	...	...
	Nurseries	...	2	...	...	1	...	...	5	...	...	5	...
	Plantations	...	2	...	...	1	...	...	5	...	...	5	...
	Garden at Kalar kahar	1	1	...	...	...	...	10	5	...	...	...	...
Talagang ...	Garden	1	2	...	...	...	...	6	5	...	...	...	...
	Nurseries	...	4	...	...	1	...	...	5	...	...	5	...
	Plantations	...	2	...	...	...	...	...	5	...	...	...	...
	Total ...	6	43	3	4	5	1	...	...	...	...	...	...

The months most favorable for tree planting are February, July and August, as reported in previous year.

Instructions are duly issued to the establishment to undertake planting during the months noted.

6 feet high plants are as a rule transplanted to roadsides, as plants smaller than these would not thrive, being easily destroyed.

In case of roadside plantations, a fence is usually made for the protection of the plants and a drain a foot deep is dug for the retention of rain-water.

The plants, trees and seedlings, are under the general supervision of the village headmen.

The Tahsildars and the District officers when on tour inspect the plantations. The establishment has remained unaltered, but as the extent of plantations is increasing the present establishment is inadequate. A small increase to the establishment will be necessary for the effectual watering and protection of the plants. As an instance of such necessity, I would refer to a fine flourishing sissu plantation at Khai, on the Pind Dadan Khan road-side, planted a few years ago, which on two occasions wholly failed, but succeeded well after a care-taker was located in the vicinity.

Financial results.—There is an increase of Rs. 10 in the income compared with the preceding year and a decrease of Rs. 579 in the expenditure, as no large sums were laid out during the year on purchase of bullocks or seedlings as required in the preceding year.

The following statement will show details :—

Name of tahsils.	Receipts.			Charges.			
	Tree cuttings.	Gardens.	Total.	Gardens.	Nurseries.	Plantings.	Total.
Jhelam	569	198	767	2,040	315	832	3,187
Pind Dadun Khan	52	144	196	343	321	...	664
Chakwal	36	97	133	452	80	120	652
Talagang	6	11	17	155	99	165	419
Total for 1883-84	663	450	1,113	2,990	815	1,117	4,922
Total for 1882-83	547	556	1,103	3,606	939	956	5,501

Increase, Rs. 10 ; decrease, Rs. 579.

The zamindars are as usual enjoined to have trees and plants reared in the vicinity of their villages, and the District Assistant Engineer has been deputed to visit localities where plantations are made, with a view to their better supervision.

21.—GUJRAT DISTRICT.

General remarks.—Tree planting during the year has been successfully carried out as will be seen from the statement. There were in all 1,182 trees put down during the year, of which only about 50 have since died. This satisfactory result is no doubt due to the seasonable and plentiful rainfall.

All the trees planted during the year were on road-side avenues; 300 were put down on the road from Gujrat to Lodra ferry, to fill up a large gap in the existing avenue. The remaining 882 trees were planted to take the places of others that had died.

Only shisham trees were planted during the year. They are considered the best in this district, and appear to be better suited to the soil than any other description.

Plantations.—There are no large plantations in this district.

Nurseries.—There are only three small nurseries in the district,—one at Gujrat behind the Church compound, one at Kharian, and one at Phalian.

Establishment.—The following establishment was maintained during the year for watering and tending young trees at an annual cost of Rs. 1,315, or Rs. 185 less than the sanctioned assignment :—

		Rs.	A.	P.
1	Jemadar @ Rs. 8 per mensem...	96	0	0
1	Chaprassie @ Rs. 5 per mensem	60	0	0
9	Bhisties @ Rs. 5 per mensem each	540	0	0
5	Coolies @ Rs. 5 per mensem each for 6 months ...	150	0	0
5	„ @ Rs. 5 per mensem each for 5 „	125	0	0
12	„ @ Rs. 5 per mensem each for 4 „	240	0	0
2	„ @ Rs. 5 do for 2 „	20	0	0
Contingencies		84	0	0
	Total ... Rs.	1,315	0	0

Tree lopping.—Great care was taken in lopping trees during the year. The income realized from the sale of loppings amounted to Rs. 741. The avenues on the following roads were lopped :—

Gujrat to Bhimber,—for 2 miles.
„ to Peru Shah,—for 2 miles.
Gujrat to Sialkote,—for 1 mile.
„ to Jelalpure,—for 1 mile.

In addition to this some of the trees on the road-sides in civil lines were also trimmed.

Transplanting.—Great care is observed in taking out seedlings from nurseries to prevent the roots of the surrounding young trees from being cut or in any way injured.

Supervision.—The tree planting operations were supervised by the District overseers and the Tahsildars.

Special events.—There were no special events during the year, such as fires &c.

22.—SHAHPUR DISTRICT.

General remarks.—The rainfall of the year under report was much less than that of the preceding year, bring 14·4 against 25·2, and the result of arboriculture operations was not fully satisfactory. Every effort was however made to preserve the plants as far as possible, by watering them by means of pakhals and bhishtis. In tahsils Bhera and Shahpur canal water was successfully utilized in propagating nurseries and plantations along the Shahpur and Bhera road; but the young shisham trees were damaged by cattle being permitted to graze among them. Two of these nurseries have been closed against grazing this year and a good result is expected.

Trees along the roadsides at some places dried up owing to want of rain, and even where watered by bhishtis 10 per cent. died; the rest are flourishing.

The soil of this district is dry and saline and suited to the growth of kikar, jand, ber, shisham, mulberry and siris (sharin). The tree planting in tahsils Shahpur and Bhera is carried on in the spring, when the canal water is available, and in the rains. In tahsil Khushab, of which the soil is most arid, tree planting is only carried on in the rains and the final success chiefly depends on occasional rainfalls during the year.

The following memo has been left by my predecessor, Lieutenant Colonel Corbyn, regarding tree planting at Sakesar in the summer of 1883, for insertion in this report :—

"All experiments heretofore tried to rear trees at Sakesar having failed, I addressed Mr. E. A. Down, Assistant Conservator of Forests at Sabathu, on the subject, having heard of his success there.

"He very kindly sent me a copy of his annual report, in which he fully detailed all he had done there. I very carefully followed his advice at Sakesar.

"I set apart small nurseries, which will be referred to hereafter, in which I planted the following seeds:—plum, mulberry, bakain, safeda (poplars), willows, shisham, kikar (acacia), and fir.

"As the climate of Sakesar is very dry and water very scarce, I adopted Mr. Down's plan of running three stakes into the ground at the foot of the trees and placed a ghara with a hole in the bottom, plugged with a rag, on the principle of the tree ghara filter, from which there is a constant dropping of water, by means of which a constant moisture is kept up, and I find this plan has acted admirably, as the gharas only need filling once in 24 hours. During the winter I have had the trees carefully covered with grass to protect them from snow and frost. If this is done for three or four years longer, I feel certain Sakesar will be thoroughly wooded.

"Of course the Sakesar rakh must be closed against grazing, otherwise tree planting will never succeed.

"An establishment of 6 belders have been sanctioned, and they are employed in planting trees, weeding, watering, and watching the rakh. Nazir Jan, darogha, a passed man in forestry trained at Changa Manga, supervises everything there.

"The following gives the area &c. of the land cultivated during the year under report.—

Shisham	10	acres.
Plum trees, mixed with mulberry and bakain,	3	"
Firs	½	"
Bamboo	6	"
Sanatha	8	"

"The rakh being closed against grazing, the indigenous trees and plants are coming on satisfactorily. The following are the indigenous trees on the Sakesar hill:—

"Dhaman, wari, olive, kangar, phulai, oak, mina, kachnal, the wild pomegranate. This should be extended as far as possible.

"Plums, peaches, apricots, grapes, pomegranates and figs, apples and pears, grow and succeed well at Sakesar if properly watered. I am trying strawberries too this year.

"Potatoes have also succeeded there, and should be put in in June. They are then ready in October. Beds should be made along the alignment of the springs where early vegetable melons, lettuce, cucumber can be grown."

Unfortunately the present spring has been a very dry one and very little water indeed has been procurable at Sakesar. This has sadly marred the success of last year's planting operations. With the present means of watering at our disposal, planting can hardly be carried on on such a scale as that contemplated by Colonel Corbyn. I think the Forest Department might very well take up the question of re-afforesting the Salt Range, and in that case commence with the lower parts of Sakesar where there are many plots of ground on which the acacia modesta would grow if the seed were simply sown and the young trees protected by rough stone walls from damage by sheep and goats.

Description of work during the year.—The total number of trees planted was 15,955, out of which 3,290 died.

Besides planting trees on the sides of roads and canals, filling gaps in the existing avenues and rearing nurseries and groves, ten gardens were maintained, *viz*, five at the sadr station and five in tahsil Khushab. All these gardens contain a number of fruit trees of various kinds.

At settlement the owners of wells in Bhera and Shahpur tahsils agreed to plant nurseries to the extent of two marlas at each well. This condition, which was hitherto neglected, was enforced in the year under report, and the plantations made in the rains are promising and will serve as nurseries for transplanting trees on the sides of roads and canals in future.

One reason for trees failing on the road-sides is that the ditches along the roads in which the trees are planted were not cleared out at the time of repairing the roads, and rain-water therefore did not stand in them.

Kikar has been so plentifully sown in former years on plots of Government land in and near Shahpur, that dense clumps of these trees are to be found in several places. I have endeavoured to have these thinned out. In the civil station itself the canal has made the trees spring up so rapidly that they have become overcrowded, and the circulation of the air was seriously impeded. I have commenced to thin these out also, but wood is so plentiful and cheap at Shahpur that trees, unless of really large size, hardly realize any price at all. I hope the Railway will soon be made from Bhera to Khushab, for then our kikar plantations and our crowded avenues will be valuable.

Establishment and supervision.—The establishments kept up during the year were as follows:—

Station gardens.

			Rs.	A.	P.	
2	malis	@	10	0	0	each.
2	Do.	@	6	0	0	„
5	coolies	@	5	0	0	„
5	Do.	@	4	8	0	„
1	Do.	@	4	0	0	„
1	Do.	@	2	8	0	„
1	Do.	@	2	0	0	„

Gardens in tahsil Khushab.

1	mali	@	8	0	0	
3	Do.	@	7	0	0	each.
1	Do.	@	5	0	0	„
4	coolies	@	5	0	0	„
2	Do.	@	4	12	0	„
1	blacksmith		0	4	0	

Supervision.

1	Darogha	@	30	0	0
1	Assistant	@	15	0	0

Roadside trees establishment.

15 beldars paid from District funds, and
10 beldars paid from Municipal funds @ 5 each.

With such a small establishment for actual planting and watering, not much progress can be made in the matter of road-side avenues.

Financial results.—The following is a statement of financial results for the year as compared with those for the preceding year :—

	1882-83	1883-4	Difference.
	Rs.	Rs.	Rs.
Income ...	614 ...	1,314 ...	+ 700
Expenditure ...	3,734 ...	4,823 ...	+ 1,089

Net deficit of Rs. 3,509 against Rs. 3,120.

The income of the year is dervied thus :—

	Rs.
Sale of fruits	680
Do. of wood	298
Do. do. within Municipal limits ...	31
Do. of grass	305
Total ...	Rs. 1,314

The expenditure of the year under report is made up of the following items :—

	Rs.
Pay and contingencies of station gardens	1,348
Pay of arboriculture establishment, including Darogha and assistant Darogha	1,322
Contingencies	962
Subscription to Agri-Horticultural society	129
Roadside trees establishment paid from District funds ...	718
Do. „ Municipal funds	344
Total	Rs. 4,823

MOOLTAN DIVISION.

Remarks by Commissioner.

Mooltan.—Owing to an insufficient fall of rain in Mooltan, little work appears to have been done during the year. In addition to the road-side planting a grove of 80 carob trees was planted in the district kutchery. The income from sale of twigs and of trees blown down by storms amounted to Rs. 348-10-0, and the expenditure on account pay of establishment, &c. was Rs. 5,271-13-3.

Jhang.—In Jhang, the date-stones which were put down last year in the sandy Sarkana-grown tracts, bordering the town on the south-east, have proved unsuccessful, owing to protracted drought, which also operated unfavorably for tree planting.

Of the 10,783 trees raised from cuttings and seedlings, about 7,660, or ¾ths of the whole, died during the year.

Lopping has been done under the supervision of Tahsildars by daily labour.

The income of the year under report, as compared with that of the preceding year, is much larger, and it would have been larger still had there been a demand for timber. 5,385 shisham trees have been felled at the Sajhowal plantation with a view of thinning it.

Montgomery.—Little work seems to have been done at Montgomery for the money spent. Large portions of road remain unplanted owing to scarcity of water along the the road-side. There are only two groves in this district, one at Gugera and the other at Attari. At the latter the trees are large and need no particular care.

There were no receipts from arboriculture, but the expenditure was Rs. 1,116.

Muzaffargarh.—In Muzaffargarh 7,522 trees were planted out on extending avenues on roads, and 1,633 were put in to fill up gaps in roads already reported as planted out.

The most important of the groves sown in previous years are the Waliwah plantation of 22 acres, the Basti Arif plantation of 13 acres, where there is now a large plantation of thriving trees of over 25 acres, including over 11 acres sown during the year under report, the Ghalwan plantation of 13 acres, and the Hamza Wali of 26 acres.

During the year 4 acres have been sown at Khalang and three and a half acres at Gulguliwala with shishum, and they are reported in fair condition.

The planting of 5,600 trees at the Alipur tahsil has been a great success, they have evidently been attended to with great care, and are all protected with reed fences.

The total expenditure was Rs. 8,798-6-3, as compared with 8,466-12-0 of the preceding year, and the income amounted to Rs. 543 as against Rs. 498. The Montgomery district report shows very negative results, and Jhang is not very much better. The Muzaffargurh report is very instructive, and shows that the Deputy Commissioner has some definite system for operation, and it evinces generally considerable interest in the work which, if continued to be so directed, could not fail to result in success. I quite agree in the District officer's deprecatory view as regards the unsatisfactory mixing up of expenditure on gardens with purely arboricultural work, and which obviously ought to be kept apart. The Mooltan report evinces very satisfactory results.

23.—MOOLTAN DISTRICT.

General remarks.—The rainfall was as follows:—

	Inches.
Mooltan	6·2
Shujabad	5·1
Lodhran	2·6
Mailsi	4·4
Sarai Sidhu	4·3

The rainfall was insufficient, being much less than in 1882-83.

Description of work.—The following statement, shows the amount of road-side planting done during the year:—

No.	Name of Tahsil.	Length of lines planted during the year.	Cultivation failed or destroyed.	Length of lines at the end of the year.
1	Mooltan	7,734	315	7,419
2	Shujabad	3,246	2,481	765
3	Lodhran	17,850	4,450	13,400
4	Mailsi	20,608	6,030	14,578
5	Mooltan, Municipal limits	3,230	250	2,980
6	Jalalpur Municipality ...	2,440	160	2,280
	TOTAL ...	55,108	13,686	41,422

A grove of 80 carob trees was planted near the district katcheri.

Financial results.—The following shows the financial result:—

No.	Name of Tahsil or Municipality.	INCOME.			EXPENDITURE.							TOTAL.
		Pruning of trees	Sale of old trees which fell by storm.	Total.	Pay of establishment & fodder of bullocks.	Plantation of trees.	Earthen enclosures.	Watering trees.	Donation to Agri-Horticultural Society.	Miscellaneous petty items.	Purchase of bullocks.	
1	Mooltan	45 8 0	8 0 0	53 8 0	138 0 0	50 11 3	30 0 0	283 3 9	120 0 0	6 0 0	...	627 15 0
2	Shujabad	17 11 0	38 0 0	55 11 0	144 0 0	50 0 0	...	...	...	...	...	194 0 0
3	Lodhran...	...	...	...	330 0 0	70 0 0	487 5 0	55 1 6	...	114 4 0	26 12 0	1583 6 6
4	Mailsi	...	...	...	564 0 0	55 11 9	...	128 1 6	...	9 3 0	80 14 0	837 14 3
5	Sarai Sidhu	...	...	...	336 0 0	...	...	51 9 6	...	...	...	387 9 6
6	Mooltan Municipality	239 7 0	...	239 7 0	1141 0 0	...	500 0 0	...	...	...	...	1641 0 0
	TOTAL Rs. ...	302 10 0	46 0 0	348 10 0	3153 0 0	226 7 0	1017 5 0	518 0 3	120 0 0	129 7 0	107 10 0	527113 3

24.—JHANG DISTRICT.

General remarks.—The year 1883-84 was a very unfavorable one for tree planting owing to the protracted drought, especially in the Jhang tahsil, in which, as mentioned in last year's report, some maunds of date-stones in the sandy sarkana-grown tracts bordering the town of Jhang on the south-east were put down, but without any success.

Avenues—Description of work.—1,825 trees were planted out to fill up gaps in the existing avenues, and 184 trees planted in former years died during the year.

About 255,200 feet of roads in the district are partially planted with trees. The avenues, however, are not continuous, except in short distances. It is a well known fact that trees can only be kept up in the immediate neighbourhood of wells. The only fine thriving avenue is the one lined on both sides of Kharora road, extending about 15,840 feet in length.

Groves and plantations.—In the Sadr nursery, 10,783 cuttings and seedlings of valuable fruit trees and shady trees, such as mangos, jaman, guava, apple, oranges, shisham, banyan, pipal, &c., &c., were raised; of these 1,373 were transplanted on road-sides; 600 were made over to the District Superintendent of Police; 1000 to Jhang cum Maghiana Municipality, and 150 transplanted in the station garden, and the remaining 7,660, or ¾ths of the whole, died during the year.

In the last spring 15,098 young trees were raised also, but these are not flourishing owing to the dry climate of the district. The full result, however, it is hoped, will be known after the next rainy season.

Establishment and supervision.—The following is the schedule of establishment and supervision employed for the different works :—

	Rs.
Station garden.—18 gardeners and one Jamadar @ Rs. 107-12-0 p. m. ...	1,292
Arboriculture.—24 gardeners, bhistis, water-suppliers, employed on avenues @ Rs. 132-12-0 p. m.	1,593
Water-suppliers paid annually at different rates	163
Total ...	Rs. 3,048

Supervision was carried on at the Sadr station garden as last year by one head gardener under the immediate control of the Deputy Commissioner. Road-side trees or avenues, groves, and other plantations are kept in order by the water-suppliers or tenants of the wells, under the supervision of the Tahsildars, as usual.

Financial results.—The total expenditure under the head arboriculture amounted to Rs. 4,463, as detailed below :—

	Rs.
Pay of gardeners and bhistis, &c.	3,048
Feed of bullocks...	560
Improving sadar station garden and purchasing plants from Lahore, &c.	200
Subscription to A. H. Society, Punjab	120
Miscellaneous expenditure...	535
Total ...	Rs. 4,463

The income was Rs. 831-1-2, as shewn below :—

	Rs.	A.	P.
Garden produce...	319	1	8
Sale proceeds of loppings, &c.	511	15	6
Total	Rs. 831	1	2

Lopping has been done under the supervision of Tahsildars by daily labor.

The income, as compared with that of the previous year, is much larger, and it would have been much larger still had there been a demand for timber.

5,385 shisham trees have been felled with the view of thinning the large plantation at Sajhowal, but owing to the remoteness of the locality some difficulty has been experienced in disposing of them.

25.—MONTGOMERY DISTRICT.

General remarks.

	1882-83.	1883-84.
Rainfall—Montgomery...	12·2	10·7
Gugera	12·4	7·9
Dipalpur	13·7	11·8
Pakpattan	7·4	6·9
Total ...	45·7	37·3

The rainfall during the year under report was less than the last year.

Fires.—Nil.

Description of work—Avenues.—The work carried out was the planting of fresh and the maintenance of existing trees. Avenues have been planted along one mile of road Qutab Shahana.

The roads are 1068 miles in length. The large portion of them remains unplanted, chiefly due to scarcity of water along road-side.

Groves, plantations and nurseries.—There are only two groves, *viz.* at Gugera and Attari. At the latter place the trees are large and require no particular care.

Establishment and supervision.—The following establishment was maintained during the year, and the expenditure thereon amounted to Rs. 915, against 961 in the preceding year :—

	Rs.
1 Contractor for watering trees at Chichawatni	130
1 Ditto at Dipalpur...	90
1 Ditto at Gugera	40
1 Ditto at Okara	65
Bhistis of Qutab Shahana	44
Malis, coolies, and bhistis at Sadr	546
Total expenditure ...	Rs. 915

The establishment at Sadr has worked under the supervision of Secretary District Committee, and those in tahsils under that of Tahsildars.

Financial results.—There were no receipts from arboriculture. The charge was as follows :—

	Rs.
Maintenance of Establishment, as detailed above	915
Other expenses, such as purchase of bullocks, price of seeds, cleaning wells, &c.	201
Total Expenditure ...	Rs. 1,116

26.—MUZAFFARGARH DISTRICT.

General remarks.—Nil.

Description of work—Avenues.—The general results are as follows :—On extending avenues of roads 7,522 trees were planted out, while 1,633 were put in to fill up gaps in roads already reported as planted out.

Plantations.—In groves and plantations 282 trees have been planted out, while 19 acres 2 roods 21 poles were sown with seed. Of the trees planted out very few are reported as dead, but a good many notwithstanding may be regarded as if they were dead.

The men who have charge of trees which die will never admit that a tree is dead so long as they can conveniently show a fresh plant in room of the dead tree, whether there is any prospect of the plant thriving or not.

Success in planting on roads—Muzaffargarh.—Of the trees above planted out 1,454 were put in to fill up gaps on roads in the neighbourhood of Muzaffargarh. I have no favorable account to give of them. The reason is that the gaps are, in the first instance, due to an unfavorable soil, in which only some trees will grow. It does not matter how often the gap is filled, so long as a tree of the proper sort is not used there is no result. To remedy this, I have ordered gaps generally to be filled up with tamarix, which will grow almost anywhere, although of course not a good description of tree if better were available.

Tahsil Sanawan.—In Sanawan tahsil 1,952 trees were planted out to extend avenues. I have a much more favorable account to give of them. The fault there is that the roads operated on are to a large extent filled with trees of spontaneous growth, *viz.*, ber, kikar and tamarix. Trees of the better sort cannot thrive in such company, and it is almost waste trying to grow them. Under these circumstances I ordered the Tahsildar, wherever he determined to grove shishams and the like, to prepare the ground by clearing off the spontaneous trees, and for the rest to fill up the gaps where there are such trees by trees of the same sort. He has accordingly, I believe, cleared out the coarse wood for some miles on each side of Sanawan, and of the towns Daeradinpanah and Kotaddu, so that there will be a possibility of growing a good avenue there.

Elsewhere the avenues will be extended at small cost by chiefly planting tamarix, kikar, and the like. Operations for the current year have been arranged on this footing.

Tahsil Alipur.—In the Alipur tahsil splendid work has been done by planting out 5,600 trees on the Muzaffargarh-Alipur road. I have never seen better work anywhere. The trees have been evidently attended to with great care, and, which is the most important thing of all, they have been efficiently protected by fences made of reeds.

The great success in Alipur is some compensation for the comparative failure elsewhere, especially in Muzaffargarh.

Plantations.—During the year four acres have been sown with shisham at Khulang. I have not seen it, but the Tahsildar lately visited it, and reports the plants to be in fair condition. Three-and-a-half acres were sown with shisham at Gulguliwala in a Government rakh, and they are reported in fair condition. Over 11 acres were sown at Basti Arif, where there is now a large plantation of thriving trees of over 25 acres.

The most important of the groves planted out, or rather sown in previous years, are the Waliwah plantation of 22 acres, the Basti Arif plantation of 13 acres, which I have already noticed, the Ghalwan plantation of 13 acres, and the Hamzawali of 26 acres. The Waliwah is doing very well, as well as the plantation at Ghalwan. The success of the Hamzawali plantation is not yet assured. It will perhaps be necessary either to abandon it or to go to considerable expense to make a canal cut to it.

Correction of last year's report.—Mr. Maconachie in last year's report stated that 51,941 trees had been planted out in groves, of which most were thriving. In making this statement he was under a misapprehension I believe. These are the number of seedlings that had come up from seed, and their number is of very little importance, because an immense number of these could not from their position by any possibility come to be trees. One gets no idea of the work done by getting these seedlings enumerated. A much better idea is to be obtained by learning what area has been sown with trees and what is their condition.

Statements confused by entry of a large number of small plots.—I observe the statements are confused by the entry of a very large number of groves planted out in former years, in which nothing is done.

A regular well-considered scheme of operations a desideratum.—Mr. Maconachie last year insisted on the advantage of following out continuously a regular scheme.

There can be no doubt that a well considered scheme is a great desideratum. There is a very large expenditure here on arboriculture considering the resources of the district, and it is very desirable that it should be well directed. It has in my opinion been in a great measure very badly directed. Mr. Maconachie says "it should be remembered that success in planting sandy sun-baked roads is really a greater achievement than obtaining a large number of trees where the heat is less terrible to the traveller." As an abstract proposition I would not dispute this, but I would maintain, as a matter of expediency, that such success is not at present to be aimed at, and that any attempt to attain it is likely to be disastrous. It would be madness for instance to attempt at present to plant trees across the Thal between Muzaffargarh and Kuraishi, or on any other of the Thal roads, so long as there are roads where success with a fair amount of ease is assured. I would here mention the roads which I think should first be filled with trees. They are the road from Muzaffargarh to Alipur and as far below Alipur towards Sitpur as protection from flood can be obtained; the road from Daeradinpanah to Kuraishi; and when the road between Kinjar and Jatoi is constructed, then right on by Jatoi to Alipur; the road from Shahrsultan to Jatoi; that from Alipur to Khairpur, where there is protection from flood; the road from Kinjar to Khangarh; the customs roads from Kinjar; any parts of the Muzaffargarh-Rangpur road that would not be flooded.

This is not a very extensive seheme, and if steadily kept in view might all be overtaken in a few years. We have some excellent avenues as it is, but we might easily have more such that it would be impossible to match them anywhere else. After these roads had been dealt with, then the Deputy Commissioner might make an attempt on some of the sandy sun-baked roads of the Thal.

Operations on plantations condemned.—I do not object to small groves here and there along the roads at intervals, more than I do to avenues, nor do I object to them at encamping grounds or near public buildings. On the contrary, efforts should be made to raise such groves. What I do object to is those large plantations such as the Waliwah, Basti Arif, and so on. There I think, even if successful, our precious money is all but thrown away. I do not think these groves will be very successful. They cannot all be supplied with water in perpetuum, and without that no trees will thrive in this district which are not planted within reach of the spring level, because the rainfall is too small.

The District Committee has got abundance of work without going into forestry. I should leave that to the Forest Department, which is well established in the district. The proverb—'The shoemaker to his last,' should not be forgotten by it. My advice with regard to the plantations that have already been sown is to attend to them carefully for two or three years and give them a chance, and after that to wash our hands of such work for ever, and devote attention to avenues as detailed above, and to groves that would be a convenience to the public.

Financial results.—The total expenditure was Rs. 8,798-6-3, as compared with Rs. 8,466-12-0 of the preceding year, but of the former sum only Rs. 6,541 was really expended on arboriculture, the rest being expended on gardens &c. Endeavour is being made to retrench this latter expenditure as much as possible.

The way in which the expenditure on arboriculture is mixed up with that on gardens, and generally the way in which it is shown in the accounts, seems to me very unsatisfactory. Expenditure on an object which is deservedly regarded as so important as to demand a special report, might surely be separately shown.

Income.—The income amounted to Rs. 543 as against Rs. 498. This includes money realized for sale of fallen trees, sale of loppings, garden produce, and other odds and ends. To this mode of crediting income I would take the same objection as I have done to the expenditure.

DERAJAT DIVISION.

Remarks by Commissioner.

Dera Ismail Khan.—As far as it is possible with the means at his disposal and the climatic conditions to be dealt with, the Commissioner thinks the Deputy Commissioner of Dera Ismail Khan is doing good work, which necessarily is chiefly observable where the conditions are favorable on irrigated tracts and at head-quarters.

It is mentioned that the Commissioner introduced the gum trees here, but this had been done in some instances before the Commissioner came in the end of 1880, though since then in the civil part of the station great numbers have been planted.

Bannu.—In the Bannu district there are many roads and places where water is available, and where arboriculture should flourish, as all natural conditions are favorable. Years ago, and also in 1865, fine avenues were planted out by Major Urmston, Deputy Commissioner, but since then they have been little extended or properly maintained and gaps filled up.

The present Deputy Commissioner, Major Conolly, desires to see arboriculture succeed, and a Darogah has been appointed. This Darogah had very crude notions of pruning, The Commissioner explained to him on one or two occasions how it should be done. It is to be hoped that arboriculture will now improve in those localities where the conditions of water and soil are so favorable.

Dera Ghazi Khan.—Arboriculture continues to receive great attention in the Dera Ghazi Khan district. Mr. Fryer, late Deputy Commissioner, himself took a great interest in it, and it is fortunate that the district has Mr. Dames, Judicial Assistant Commissioner, who is also fond of it and possesses besides considerable botanical knowledge. Mr. Nulty, Head Clerk and Secretary District and Municipal Committees, keeps up the system; he has also a taste for gardening and arboriculture, and so here there is something done with effect every year. The distribution of fruit trees free to the people of the district appears to be creating a general interest in extending their cultivation.

They are also planted out in groves and on road-sides. The gardens at Fort Munro continue to flourish; the injury to gum and poplar trees noticed is no cause for regret, as they are not suited to the localities. Firs, pines, and fruit trees thrive there, and are most suitable.

27.—DERA ISMAIL KHAN DISTRICT.

General remarks.—Rainfall.—It was 7·90 inches. Since July last drought has prevailed and large numbers of cattle have perished in the Thal, Cis-Indus, and Dámán, Trans-Indus. The rainfall from August 1883 to end of May 1884, *i. e.* for the last ten months, has been 4·7 inches.

Irrigation.—Except along 27 of the 42 miles of the Tank road, and round about Dera Ismail Khan itself, there is no road-side irrigation for trees in the district.

Avenues.—The trees on the Tank road are doing well. There are few avenues of any length except on that road, and for about 7 miles about the head-quarter station.

Species of trees.—The species of trees suited to the district are kikar, ber, sarin, shisham, tamarix, bhani, and khagal (farash).

The pepper trees mentioned last year are succeeding wonderfully; as also is the Australian gum introduced by Colonel Ommanney, the Commissioner, some three years ago. We have now about 500 in the station.

Groves.—Those in the district deserve no mention, except one known as Dilkhusha, near Bhakkar. It is a very fine grove, covering say ten acres. It had been very much neglected, but I have taken it in hand lately. It is full of fine old *shisham, ber,* and *siris* trees, also fruit trees.

Station garden.—A handsome ornamental garden was started by the Dera Ismail Khan Municipality two years ago, and is gradually becoming the lounge of the station, both for natives and Europeans. The Municipality hold their meetings in an arbour in it. Ornamental shrubs and plants have been planted round what is called the "circular road" round the city about three miles in circumference, and form a continuous garden. Many plants have been procured from Lahore, Bannu, Umritsar, and even Saharanpur.

Establishment and supervision.—A detail of the permanent establishment has been inserted at foot of the financial statement.

Arboriculture in a rainless backward district like this is such an expensive and disappointing culture, that to write an elaborate report on the subject is a waste of labor, as it would be a work of the imagination. As for a plan of operations, I intend to encourage tree planting wherever water is available, and nowhere else, *i.e.* near the station on Tank road, about Tank itself, and at road-side wells on Jhang road.

28.—DERA GHAZI KHAN DISTRICT.

General remarks.—The work of the year may be summarized thus :—

On road-sides nearly 300 trees have been planted, about a sixth of which are umbrageous fruit trees. In the Kot Haibat plantation 10,000 trees have been newly planted, a fair proportion of which have also been fruit trees. At Fort Munro over a hundred trees of all kinds have been planted on hills and hill-sides. About 3,000 fruit trees of all kinds have been distributed gratis to zemindars. A nursery of fruit trees has been started in the Jámpur táhsil gardens and another will be started in the Rajanpur tahsil, for the further supply of such trees to zemindars and other. Orchards and gardens planted with fruit trees are springing up in all directions but only within a certain radius of the town of Dera Ghazi Khan. The object of supplying zemindars with fruit trees has therefore been at present only attained to a slight extent. The fact, however, of so many fruit trees having been taken during the year under report, shows that zemindárs are beginning to value them, and it may be hoped that orchards in villages at a distance from district and tahsil head-quarters, will at no distant date be more numerous. A few have already been started, one of some extent, by Sayad Ahmad Shah near Pir Adil, about nine miles from Dera Ghazi Khan, and another in a most drear and arid spot at the village of Asánpur, by Sirdar Bahádur Khan Khosa. One or two smaller orchards have also been planted at Choratta, six miles from Dera Ghazi Khan. The plants for all these orchards were taken from the nurseries of the Katcherry and Government gardens.

At Fort Munro one great object is to introduce and naturalize a hardy species of trees that will thrive in a dry rocky country. Protection from grazing is greatly wanted, but at present is hardly practicable to any great extent. A small reserve, however, would in a few years prove conclusively whether it is possible to clothe the bare Sulaimán hill-sides with forest or not; and, if successful, it might serve as a nucleus for future operations on a larger scale.

This district is fortunate in the fact that both Mr. Dames, the Judicial Assistant Commissioner, and Mr. Nulty, the Secretary to the District and Municipal Committees, take a special interest in arboriculture, and have a knowledge and experience, considerably above the average, of the subject. Both were serving during the year under report under Mr. Fryer, Deputy Commissioner, who also devoted much attention to it. I will see that there is no falling off in arboricultural proceedings in the current year (1884-85).

Description of work.—During the year under report road-side avenues were extended by $6\frac{3}{4}$ miles, *i.e.* $3\frac{3}{4}$ miles in the Dera and 3 miles in the Rajanpur tahsils.

Dera Ghazi Khan tahsil.—On the road leading from the station to Dera Ismail Khan the extension was for a distance of two miles. Five miles were planted in previous years. In all seven miles are now planted.

Another mile was planted during the year under report on the Sheru road, thus making a distance of $9\frac{1}{2}$ miles planted.

Avenues on the road from Dera Ghazi Khan to Yaru were extended by $\frac{3}{4}$ths of a mile, making a total distance of $2\frac{1}{4}$ miles planted. Extensions should gradually be made, both on the Yaru and Vidor roads over the tract intervening between the Munka and Shoria canals.

Rajanpur tahsil.—In the Rajanpur Sub-Division the following extensions were made.

Asni road	...	...	...	1 mile.
Road from Kotla Nasir to Dangu			...	ditto.
Hajipur road	...	...	...	ditto.

About 1,933 trees were planted on the $6\frac{3}{4}$ miles of avenues extended, and about 1,000 trees had to be put out to fill up gaps in roads previously planted. The greater number of the trees that died were of the autumn planting of 1882-83. 1883-84 was not a favorable year for arboriculture, as there was little or no rain and the canals did not run well. Of the 2,933 trees newly planted about Rs. 500 were mangoes and jamuns and 100 tuns, the rest shísham and kikar. In future tun will be more cultivated, as it seems to thrive where water is not far from the surface. Kikar, as has been reported in previous years, is only planted where the soil is impregnated with *kallar*, as it is one of the few trees that will grow in such soil: the tamarix and the date palm being other trees which will grow in *reh* soil. In winter, however, it requires great care for the first year as unless shaded it gets frost-bitten.

Groves.—The two mangoe groves planted—one on the Rajanpur road (half-way between Dera Ghazi Khan and Kot Chutta), and the other on the Batil road,—are not doing as well as was expected. This can only be attributed to want of rain and one or two severe frosts in the winter. For the first three years mangoes grow very slowly, as they suffer considerably from frost. After that period they shoot up more rapidly. These groves will doubtless show a great improvement in another year's time.

Nurseries.—There were in all 8 nurseries maintained, the same number as last year, *viz* :—

3 on the Jampur section of the Rajanpur road ;
1 on the Sheru road ;
1 on the Sakhi Sarwar road ;
1 on the Dera Ismail Khan road ;
1 in the Katcherry garden ;
1 in the Government garden.

These nurseries are maintained to provide plants for road-side planting and are a great convenience. Moreover zamindars are encouraged to take plants free of cost from them to plant out on their own wells.

Chabri-Kot-Haibat plantation.—The Chabri-Kot-Haibat plantation was extended during the year under report by about 50 acres ; on which some 10,000 trees were newly planted. These consisted of shisham, tun, carob, mesquit, mangoes, jamuns, and mulberries. As a rule, a fruit tree is planted between every two timber trees. The carobs and mesquits planted last year are very young, being seedlings of not quite two years growth, but there is every reason to expect that they will do as well at this plantation as they have done in the gardens at Dera Ghazi Khan. About a hundred more of these plants have now been put out. The mesquit, which belongs to the common jand family (prosopis), has proved itself a hardy plant. During the whole of last winter some plants ranging from 1 to 3 years old, were kept without water and did not suffer. The experiment of extending the cultivation of guinea grass in this plantation is being continued. A large number of the plants put out last year died during the winter. Those that have survived will, during the present canal irrigation season, grow into small thick clumps. The success of the experiment will depend on these clumps surviving this, their second winter without water.

Station gardens—Nurseries of fruit trees.—In Katcherry and Government gardens.—The two large nurseries of fruit trees referred to in previous years are still maintained in the Katcherry and Government gardens ; about 3,000 trees were distributed from them gratis to zemindars. The greater number of these were mangoes, and jamuns ; plants of peach, plum, pomeganate, lime, fig, and vines were also given. There is always a large demand for grafted peach trees.

Gardens at Fort Munro.—The gardens at Fort Munro are doing exceedingly well ; some of the olives in the Khar garden have attained the height of six and seven feet, and as they are growing older are bearing better. Those, however, planted about the Khar hill are making very slow progress. This is the nature of the olive ; nothing else can be expected. The gums, poplars, and other trees planted out on the Khar hill last year were unfortunately neglected. This spring, however, a greater variety of trees have been planted out, such as oak, pine, fir, poplar, cassiarina, gravillea, cypress, juniper, and carob, and the very greatest care is being taken of them. Mr. Dames is introducing nurseries of the chilgoza pine (which grows extensively about the Sulemáni Takht and surrounding hills), of diár, fir, and chinar (of which seeds were obtained from Hazara), and also of walnut and the pistachio nut tree. He has also grown successfully from seed, which he brought out with him from Portugal, the pepper tree (schinus molle). A proper statement of avenues, groves and nurseries in the form prescribed in Conservator of Forests Report for 1882-83, Sec. 17, is attached as Appendix B.

Financial results.—The expenditure during the year from all sources (Municipal, District and Provincial) on arboriculture proper and maintenance of gardens and road-side avenues, amounted to Rs. 6,907, as against Rs. 7,054 of the previous year. A statement, as suggested in para 18 of printed report for 1882-83 of Conservator of Forests, accompanies as Appendix C.

29.—BANNU DISTRICT.

General remarks.—The rainfall was less than in the previous years, but was timely and seasonable for planting and transplanting of trees.

The large amount of failures is accounted for by the drought which prevailed during the greater part of the year.

In addition to the avenues, road-side trees, &c. mentioned in the progress statement, there is a grove at Kamar Mushani, and plantations are maintained around the several public buildings in the district, such as sarai, dak-bungalows, tahsils, thanahs, dispensaries &c., details of which were given in the statements for previous years.

A separate report regarding the Public Works Department road-side trees has been submitted to the Executive Engineer, Derajat Division, through the Assistant Engineer Bannu, *vide* copy attached.

The results of the year are on the whole satisfactory.

A new Darogha was appointed at the end of the year, and it is expected that with his supervision the work of planting and tending trees will be carried on with more energy and success than heretofore. Proposals for increase of the subordinate establishment in those parts of the district where there is scarcity of water are under consideration. A scheme is also on foot to get the village Lambardars and notables to take some interest in arboriculture.

In many places where water is abundant the number of malis might be decreased, and the work of tending and planting trees, making nurseries, entrusted to the village Lambardars under the supervision of the District Committeee members. This plan was found to work well in Peshâwar district. No reasons why it should not succeed here.

Description of work.—The work done during the year was on the whole satisfactory, especially in the sadr tahsil. The work of planting was chiefly confined to filling up gaps between road-side trees. A considerable portion of the circular road was replanted with trees, a great proportion of which are doing well.

Lopping trees.—Lopping of the trees was commenced in February and finished at the end of March.

Great care was taken in the execution of this work, which was carried out by the Darogha under the supervision of the Secretary Local Funds.

A sum of Rs. 134 was realized by the sale of the branches of trees, of which Rs. 69 was paid in the treasury during the year and Rs. 65 in the month of May 1884.

Establishment and supervision.—There were 10 malis under the supervision of a Darogha on road-side trees during the year, as per detail below :—

	No. of malis.	Rate per month.	Annual amount.	Darogha.	Actual expenditure. Rs.	A.	P.
Bannu	1	7	84	Rs. 18×12=Rs. 216	234	0	0
Do.	2	10	120				
Laki	3	15	180		206	8	0
Isakhel	2	9	108		108	0	0
Mianwali	2	10	120		120	0	0
Darogha...	...	...	...	...	172	15	6
Total ...	10	51	612	216	841	7	6
			828				
Add amount paid for tending trees					58	0	0
Grand total					Rs. 899	7	6

Besides the above there were two malis at the Mianwali garden and one at Naurang well, where there are nurseries for road-side trees. The total expenditure incurred in the maintenance of the former was Rs. 218 and that of the latter Rs. 116-9-9.

Financial results.—The following is a detail of the total income and expenditure for the year under report :—

Income.	Rs.	A.	P.	Expenditure.		Rs.	A.	P.
				Road-side trees.				
				Darogha ...	Rs. A. P. 172 15 6			
Sale proceeds of branches of trees ...	69	0	0	Malis on roads ...	668 8 0			
				Tending trees ...	58 0 0			
						899	7	6
				Mianwali gardens		218	0	0
				Naurang Nursery		116	9	9
				Subscription to Lahore garden ...		121	4	0
				Total ...		1,355	5	3

This shews a deficit of Rs. 1,155-1-3 or Rs. 1,276-5-3.

Copy of No. 172, dated 6th June 1884, from the Deputy Commissioner, Bannu, to the Assistant Engineer, Edwardesabad.

With reference to your No. 163, dated 10th April last, I have the honor to return the statement therewith received, duly filled in as requested.

The following is a brief report on the planting of trees, expenditure incurred, and income derived during the year under report.

Transfer of charge.—The charge of the Public Works Department road-side trees was made over to Deputy Commissioner in June 1883, and a sum of Rs. 478 placed at his disposal for expenditure.

Establishment.—The establishment employed during the year was as follows:—

One mali @ Rs. 5 per mensem,—on Bannu and Litamber.
Five malis @ Rs. 5 „ „ Pesu roads.
Allowance to Darogha @ Rs. 2 per mensem.

Supervision.—The supervision of the Public Works Department road-side trees and establishment was entrusted to the Darogha in charge of the malis attached to the District Fund roads, and was on the whole well done.

Expenditure.—The total expenditure incurred during the year was as follows:—

Allowance paid to Darogha	...	...	Rs. 18
Paid to malis establishment	...	...	„ 261
Tending trees	...	...	„ 50
Enclosure walls round trees	...	...	„ 148
			Rs. 477

Income.—The sum of Rs. 127-10-0 (after deduction of commission) on account of sale proceeds of branches of trees, was realized and credited in the Bannu treasury in favor of the Public Works Department in the month of May 1884.

General remarks.—The results of the year under report were on the whole satisfactory. A new Darogha was appointed at the end of the year, and under whose supervision the work of planting and tending was efficiently carried out, and lopping was carefully done, in consequence of which a considerable income was realized. It is expected that considerable improvements will be effected during the current year.

Progress Statement of Avenues in the Bannu district.

The total length of roads in the district is sixty-eight miles.

Of Canals—*nil.*

I		II	III	IV	V	VI	VII		VIII
Road or Canal on which avenues have been planted or are in course of construction.		Length of single lines stocked with trees or established plants at the beginning of the year.	Length of single lines planted during the year.	Length of single lines on which cultivation has failed or on which trees or established plants have been destroyed or felled.	Length of single lines stocked with trees or established plants at the end of the year.	Species of trees cultivated.	Rainfall.		
Name of	*Total length in feet*	*Feet*	*Feet*	*Feet*	*Feet*		*Average for 5 years*	*During the year.*	REMARKS.
Bannu to Gambila,	132,000	76,510 71,230	15,880 18,480	5,526 5,588	86,824 84,122	Shishum, mulberry, willow, &c.	12·5	10·2	
Litamber road ...	58,080	8,250 8,250	2,750 2,750	1,520 1,520	9,480 9,480	Do.			
Kurram Fort road,	25,646	19,459 18,909	1,755 1,755	2,200 2,200	19,014 18,444	Do.			

PESHAWAR DIVISION.

Remarks by Commissioner.

Peshawar.—With reference to the remarks of the Deputy Commissioner Pesháwar, the Commissioner thinks the great objection to mulberries as road-side trees are that the roots spread laterally to great distances, and perhaps there is no tree more injurious to the neighbouring crops.

Near habitations it is objectionable on account of the flies it brings in the fruit season.

And it is much liable to injury owing to the people climbing the trees for the fruit and breaking the branches.

Roadside arboriculture is well attended to in Peshawar ; the cost being about Re. 1 per every ten trees planted out.

The Peshawar Jhil gave a return in grass and reeds of Rs. 520, not in wood ; the expenditure being Rs. 192. The removal of the Commissariat elephants from Pesháwar has reduced the consumption of the fodder and the income.

Kohat.—In Kohat little was done ; there are no funds and the soil is very stony, and in no district perhaps is there a traffic so large and destructive to trees by camels and bullocks, the owners being men of independent territory, without respect for District trees. I wish more could be done.

Hazara.—In Hazara autumnal tree planting has been tried, and successfully, for the first time ; formerly such operations were conducted in the spring. Certainly the transplanting of large deodar trees in Abbottabad proved to be most successful, the trees showed no signs of suffering from the move ; seedling trees from pots have been distributed in large numbers. The district has been troubled with excessive rainfall and high winds. There was an expenditure of Rs. 3,057 and an income of Rs. 2,075, a net expenditure of Rs. 982, and apparently for this some 34,182 trees were planted.

Mr. Hewson, the Head Clerk of the Deputy Commissioner's office, takes much interest in the gardening and arboriculture, and the district is indebted to him.

30.—PESHAWAR DISTRICT.

General remarks.—There has been nothing particular to record in the year under report affecting arboriculture. At the beginning of the year certain grants were made to the Tahsildars for planting trees ; a great number were planted and are thriving. In some places where canal water is not available, bhistis were entertained for watering the trees. March and August are the most suitable months for transplanting ; pruning is done in August. The mulberry is the tree that thrives best in this district, it is good for road-sides, being shady in the summer. Shisham does not grow to any great size here. Pipal and bor grow well, so also does the cotton tree. Siris does not thrive when young ; it is very liable to be injured by frost.

Description of work.—34,637 trees of various description were planted throughout the district during the year under review, at a cost of Rs. 3,733, or Rs. 53 below the expenditure of the previous year. The following is the detail of trees planted out on the roads in the district.

Tahsil	Pesháwar	8,550
„	Murdán	3,950
„	Utmán Balák	1,284
„	Hushtnagar	3,186
„	Doaba Daudzaí	17,667
	Total	34,637

The number of nurseries for planting young plants was the same as reported in 1881-82. The trees planted out during the year are in good order and great attention was paid to the tending and maintenance of trees already planted. Lopping is done with the saw and hatchet, and was carried out under the supervision of the Tahsildars.

Establishment and supervision.—The strength and cost of the establishment employed for the different works were as follows :—

					Rs.
1 Darogha	@ Rs. 60	per mensem	for 3	months ...	180
1 Jemadar	@ Rs. 10	„	for 12	„ ...	120
					——300
1 Mali	@ Rs. 8	„	8	„ ...	64
2 do	@ Rs. 7	„	11	„ ...	154
1 do	@ Rs. 7	„	1	„ ...	7
					——225

				Carried over			525
20	malis	@ Rs. 6	per mensem for	3	months	... 360	
2	do	@ Rs. 6	„	9	„	... 108	
43	do	@ Rs. 5	„	12	„	... 2,580	
1	do	@ Rs. 5	„	9	„	... 44	
1	do	@ Rs. 4	„	12	„	... 48	
New well for watering trees						42	
							3,182
Purchase of seedlings							16
Planting nurseries							10
					Total ...	Rs.	3,733

The Tahsildars and Naib Tahsildars when moving about in their respective tahsils, supervise the above establishment. The District officers make inspection when on tour. A great deal of attention has been directed to the improvement of arboriculture.

Financial results.—The accompanying statement prescribed by the Conservator of Forests in para. 18 of the annual Arboriculture report for 1882-83, will show the receipts and charges of the year on arboriculture operations.

Jhil plantation.—As requested by the Conservator of Forests, Punjab, I note here the receipts and charges on account of this plantation.

	Rs.
Received from the Assistant Conservator of Forests, Punjab ...	192.

Expenditure.		Rs.
Jemadar @ Rs. 10 per mensem		120
Choukidar @ Rs. 6 „		72
Total ...	Rs.	192

I would mention here that Rs. 520 realized from the sale of grass and reeds was duly credited to Government under the head of—Forests, remittances.

31.—HAZARA DISTRICT.

General remarks.—For the first time autumnal transplanting has been tried in this district, and in spite of the severe winter the trees so planted are doing well. This plan has many advantages over transplanting in the spring, when but six weeks at most are available, *i. e.* from 1st January to 15th February, when the work to be done has to be pushed on with what labor is obtainable. By transplanting in the autumn there is no necessity to hurry operations; the zemindars are free from their own work and are available, and the time extended from 15th October to 15th February. Further, the trees planted have been roughly dug up without any ball of earth, and in many cases carried long distances. Should the trees so transplanted do as well through the coming dry months May, June, and half of July as they are doing at present, tree planting will be much less expensive than it has hitherto been. The large trees seem to do better when transplanted in the autumn, and the young trees when moved in the spring. Some 30 diár trees from 10 to 20 feet high were transplanted with balls of earth in the Abbottabad garden, and some other large timber and fruit trees have also been so transplanted in the autumn, and are doing well so far. 2,154 seedling trees from pots grown in the Abbottabad garden were distributed gratis to zemindars, 10 to each applicant. The agriculturists know little about tree culture, but even allowing only ten per cent. to succeed, still, if this practice is continued, there ought in a few years to be a good number of trees in the district. The difficulty is to get the zemindars to grow trees at all in the Abbottabad and Mansehra tahsils.

The rainfall was excessive during this winter and killed many trees, and the high winds that followed the snowfall did much damage to the eucalypti, thinning the upper branches considerably, bringing a large harvest in firewood and seeds without the trouble of lopping the branches, which were, as far as the labor obtainable is concerned, inaccessible.

Description of work.—1,200 trees were planted along 2½ miles of the Dhobighat road completing the avenue. This road is most difficult to plant with trees. There is no berm and the soil is "rash" or reclaimed swamp. In the winter and rains it is like a sponge, and in the dry months like hard and dry rock, and the trees have been planted thickly, but experience shows that many of the trees planted must die and the gaps be replanted next year. Many of the trees planted in former years are, however, doing well *in situ*.

31 trees were planted on the circular road at Mansehra, and 300 trees were planted in 4½ miles of district road in Mansehra tahsil.

Establishment and supervision.—The establishment will be shown below. The Abbottabad garden was under the charge of Mr. Hewson, Head Clerk, and the Haripur gardens and nurseries and the nurseries at Shinkiari and Mansehra under the Tahsildars of Haripur and Mansehra.

Financial results. Expenditure.

DISTRICT FUNDS.

		Rs.
Head mali for 6 months at Rs. 11-8	... ...	66
5 Malis at „ 5	... ...	300
2 „ at „ 6	... ...	140
1 „ at „ 6	... ...	72
1 „ at „ 7	... ...	83
Contingencies	... ...	208
Annual subscription to Agri-Horticultural gardens, Lahore	... ...	120
Total	...	989

MUNICIPAL.

17 Malis and contingencies	...	2,068
Grand total	...	3,057

Income from grass, vegetables, fruit, and loppings.

		Rs.
District Fund	...	112
Municipal Fund	...	1,963
Total	...	2,075

32.—KOHAT DISTRICT.

General remarks.—The rainfall amounted to 18 *inches, which is about the* district average. It was well distributed and was sufficient for the purposes of plantation; very little, however, has been done in this respect of planting trees, as the contribution obtainable from the district funds is too small and the nature of the soil is too stony to admit of planting out to any great extent.

Description of work.—Only 247 trees were planted as against 586 in the year preceding. The former were planted on the circular road, *i. e.*, in avenue 242, and in orchard near the Cant tonment gate, *i. e.*, in groves 5. The trees planted have not done well, owing to the nature of the soil, and most of the new trees planted merely take the place of former trees that have died.

The following are the species of trees put in :—Shisham, tut, sarin, kikar, sufeda.

The average number of trees successfully planted was 79 per cent.

Supervision and establishment.—The strength of the establishment is the same as reported last year, *viz* :—

	Rs,	Rs.
3 malis @ Rs. 5 each =	15 =	180
2 bhistis @ „ 6 & 1 @ Re. 1-0 =	7 =	84
Total @ Rs. 22	...	264
Planting	...	100
		364

or Rs. 264 per annum.

II.—CANAL ARBORICULTURE.

1.—UPPER SUTLEJ CANAL.

General remarks.—Trees falling within limits of the widened channel of the Khanak Canal between Nijabat and Nuthu Shah were cut and jungle cleared at a cost of Rs. 3,929.

Description of work.—The trees on these canals are of spontaneous growth. The trees planted in the compounds of the Gudar Malkana, Lola, Ladhewal, Bunga, Hyat, and Ladian choukies were tended and watered.

Establishment.—Five bhishtis at Rs. 5 per mensem were employed during the year,—one for each choukie compound mentioned above. Their work was supervised by the subordinates in charge of the canals.

Financial results.—The income derived during the year was as follows :—

		Rs.
By sale of wood		1,755
By sale of grass		2,520
Total ...	Rs.	4,275
Deduct expenditure		4,271
Net profit ...	Rs.	4

These canals running in a country having a very small rainfall and carrying a supply of water during only a portion of the year, cannot have their banks and spoils planted out systematically without a large expenditure which the capital accounts cannot sustain. The value of fuel and timber in this part of the country is so low that the cost would be more than the worth of the plantation. The chief part of the income in this Division is derived from grazing dues and the sale of sarkanda grass, of which there is a copious growth on these canals and which is in much demand.

UPPER SUTLEJ DIVISION INUNDATION CANALS.

Statement showing number of trees at the close of 1883-84.

	Number of Trees.															Total.			Grand Total.	Bamboos in clumps.
	Sissu (*Shisham*).			*Kikar*.			*Tun*.			*Mango*.			*Other kinds*.			Class.				
	Class.			Class.			Class.			Class.			Class.							
	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.		
Main Canal and Branches.																				
Katora canal	...	115	510	...	1,435	5,565	...	...	...	...	...	...	...	234	1,666	...	1,784	7,741	9,525	...
Khanwah canal	...	2,130	692	...	17,658	9,658	...	...	...	...	1	...	...	5,150	7,934	...	24,939	18,284	43,223	9
Upper Sohag canal	...	921	955	...	7,794	17,307	...	...	...	...	...	...	...	2,433	10,522	...	11,148	28,784	39,932	51
Lower Sohag canal	...	...	...	...	...	8	...	...	...	...	...	...	...	1	14	...	1	22	23	...
Total ...	...	3,166	2,157	...	26,887	32,538	...	...	...	...	1	...	...	7,818	20,136	...	37,872	54,831	92,703	60
Distributaries.																				
Attari Rajbaha, Katora canal	...	...	100	...	70	198	...	...	...	...	...	...	...	195	3,163	...	265	3,461	3,726	...
Chunian ,, ,, ...	...	...	7	...	...	110	...	...	...	...	...	...	...	...	1,884	...	...	2,001	2,001	...
Pakhoki ,, ,, ...	...	...	15	...	...	169	...	...	...	...	...	...	...	...	428	...	...	612	612	...
North Rajbaha, Khanwah canal	...	210	279	...	1,942	2,387	...	...	...	...	...	...	...	149	709	...	2,301	3,375	5,676	...
South ,, ,, ...	...	400	260	...	1,206	977	...	...	...	...	...	...	...	319	764	...	1,925	2,001	3,926	..
Bahawaldas ,, ,, ...	...	160	232	...	902	295	...	...	...	...	...	...	...	67	239	...	1,129	766	1,895	...
Bapparwal Rajbaha, Upper Sohag canal ...	...	3	3	...	291	563	...	...	...	...	...	...	...	41	778	...	335	1,344	1,679	...
Bunga Salewal ,, ,, ...	...	20	16	...	355	1,125	...	...	...	...	...	...	...	68	209	...	443	1,350	1,793	...
Total ...	...	793	912	...	4,766	5,824	...	...	...	...	...	...	..	839	8,174	...	6,398	14,910	21,308	..
Grand Total ...	...	3,959	3,069	...	31,653	38,362	...	...	...	...	1	...	...	8,657	28,310	...	44,270	69,741	114,011	60

2.—LOWER SUTLEJ AND CHENAB DIVISION, INUNDATION CANALS.

General remarks.—As stated in former Reports, it is useless attempting to plant trees upon the canal spoil banks, as they would be destroyed during the clearances. The trees that are growing upon the banks are self-sown. For the most part they grow at the water's edge.

The heads of the canals for some miles are generally nearly bare of trees, but sirkanda grass is found in great abundance. Again as a general rule the banks at the tails of the canals are covered with jungle bushes of karil, tamarix, and such like. These are sold for brick-burning, &c. It is in the central portions of the canals where the principal trees are found.

The reason of this is that the heavy silt or sand deposits at the heads and the spoil banks are therefore composed of nearly pure sand for a long distance. At the tails the deposit is clayey. In the centres there is little of any kind.

Count of trees.—This is submitted for the first time. According to this count there are altogether in the whole Division 173,906 trees of sorts. By far the larger number are trees of little value, such as farash, &c. There are 40,500 kikar and only 16,660 sissu; of these 3,867 are six feet and over in girth. In this Division valuable trees are only sold under the following circumstances:—1st,—when a canal has to be widened: it is necessary then to cut down those growing at water's edge; 2nd,—when they fall or threaten to fall into the canal; 3rd,—on the Sirkarí Larhs, the irrigators have trees given to them free when they require wood for repairs of well machinery. This is in accordance with the terms of present settlement. A large number of trees are given away annually in this way. The kikar trees throughout the Division are lopped mercilessly and the lung sold. This is an old custom, and the people would probably think it a hardship if they were deprived of what is a privilege; but it does not improve the trees.

Form of progress statement of avenues.—This form I have not filled up. It is not applicable to this Division. There are no avenues and no lines of trees properly so called. Excepting along the Chenab Bund, where for a portion of the length, 2 lines have been planted along the outer boundaries. To give the total lengths of canals as "lengths of live trees" would be quite misleading, as no planting operations are undertaken upon the canals. The count of trees will give a much better idea of the actual facts than if I attempted to fill up this statement.

Description of work.—The smaller shisham trees on the Chenab Bund have been watered by bhistis as usual; many of those first planted no longer require artificial irrigation. The trees in chauki compounds have been kept watered either by wells or jhallars. No fresh planting operations have been undertaken during the year.

Establishment and supervision.—For the Chenab Bund, 1 mate at Rs. 8 and 6 bhistis @ Rs. 6 for 12 months. For chauki compounds, 1 mate @ Rs. 8 and 5 beldars @ Rs. 6 and 3 beldars @ Rs. 5 for 12 months.

Hire of a pair of bullocks for 12 months for Kehrord Chauki, and the same for Shujabad.

Financial results.

Receipts.	Rs.	A.	P.	Charges.	Rs.	A.	P.
Sale of wood	5,728	4	6	Watering trees, &c., ...	1,916	15	2
Lung and sirkana ...	3,299	1	9				
Fruit	92	8	0				
Crops	2	13	0				
Total ...	9,122	11	3	Surplus ...	7,205	12	1

LOWER SUTLEJ AND CHENAB DIVISION I. CANALS.

TABLE V. A.

LOWER SUTLEJ AND CHENAB DIVISION I. CANALS.

TABLE V. A.—NUMBER OF TREES AT THE CLOSE OF 1883-84.

No.	NAME OF CANAL.	NUMBER OF TREES.															GRAND TOTAL.
		SISSU.			KIKAR.			MANGOES.			OTHER KINDS.						
		Class.			*Class.*			*Class.*			*Class.*			*Class.*			
		1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	
	CHENAB SUB-DIVISION.																
	MAIN CANALS.																
1	Matithal	56	113	121	34	344	436	...	...	...	81	759	750	171	1,216	1,307	2,694
2	Khadal	1	153	134	18	359	622	...	...	...	5	162	128	24	674	884	1,582
3	Tahirpur	9	3	14	1	118	319	...	...	...	2	48	105	12	169	438	619
4	Dourana Langana	36	73	64	23	282	818	...	...	...	21	335	698	80	690	1,580	2,350
5	Shahpur	132	88	34	46	512	456	...	6	...	7	353	212	185	959	702	1,846
6	Wali Mohamed	908	2,572	1,461	76	570	220	1	12	19	151	1,816	434	1,136	4,970	2,134	8,240
7	Sikandrabad	143	183	224	49	560	711	...	...	...	184	4,183	2,770	376	4,926	3,705	9,007
8	Gajjuhatta	241	320	182	52	263	267	3	26	5	177	736	868	473	1,345	1,322	3,140
9	Bakhtuwah	421	548	156	91	440	258	2	87	60	18	289	484	532	1,364	958	2,854
10	Dhuddú																
11	Panjani	1	18	2	...	5	2	...	...	...	18	218	215	19	241	219	479
12	Sikandarwah	33	38	19	109	577	472	...	...	...	26	598	554	168	1,213	1,045	2,426
13	Belochanwalla...	...	...	...	47	244	268	1	1	...	1	26	94	49	271	362	682
	Total Main Canals ...	1,981	4,109	2,411	546	4,274	4,849	7	132	84	691	9,523	7,312	3,225	18,038	14,656	35,919
	BRANCHES OR SIRKARI LARHS.																
1	Jalalshah	...	10	16	...	64	250	...	...	...	15	37	37	15	111	303	429
2	Khairpur	...	...	...	...	4	13	...	...	...	...	145	199	...	149	212	361
3	Khandar	43	16	5	61	202	100	...	...	...	119	450	743	223	668	848	1,739
4	Daud Sher	25	44	46	44	162	207	...	...	...	6	39	84	75	245	337	657
5	Kamandi	5	13	13	12	125	105	...	...	...	...	14	12	17	152	130	299
6	Nagawah	12	21	19	9	135	123	...	...	...	9	70	132	30	226	274	530
7	Darmwah	16	9	1	2	21	11	...	...	...	7	50	41	25	80	53	158
8	Kashni	...	...	...	1	27	7	...	...	...	...	25	36	1	52	43	96

9	Jamiat	...	1	1	4	23	25	...	...	...	13	74	48	17	98	74	189
10	Rajewah	12	9	3	...	25	8	...	...	...	16	143	97	28	177	108	313
11	Khilluwah	65	110	59	8	110	148	2	6	...	23	173	260	98	399	467	964
12	Shahla Bagh	7	13	2	5	49	68	...	...	...	...	89	19	12	151	89	252
13	Baghi	57	83	21	13	107	87	43	69	28	24	214	139	137	473	275	885
14	Sarwarwah	5	5	8	4	46	25	...	...	...	...	2	3	9	53	36	98
15	Nagni	230	177	32	50	343	213	4	12	19	5	54	32	289	586	296	1,171
16	Shershahi	351	463	66	10	338	139	1	7	12	14	42	57	376	850	274	1,500
17	Mubarikbagh	67	48	8	1	21	8	1	...	1	1	49	17	69	118	34	221
18	Khairpur	27	47	7	8	27	16	...	...	...	5	164	43	40	238	66	344
19	Warianwala	123	184	29	2	12	11	1	2	1	38	370	66	164	568	107	839
20	Lanitwah	28	82	28	15	237	79	1	8	...	42	400	351	86	727	458	1,271
21	Chotianwala	14	54	16	6	37	3	...	...	...	1	7	...	21	98	19	138
22	Ranjhewah	52	49	6	9	36	8	...	...	...	...	8	...	61	93	14	168
23	Dhundu	267	213	55	97	243	125	...	...	2	39	171	119	403	627	301	1,331
24	Wahar Branch	...	...	...	17	105	124	...	...	...	16	108	143	33	213	267	513
	Total Branches or Sirkari Larhs...	1,406	1,651	441	378	2,499	1,903	52	104	63	393	2,898	2,678	2,229	7,152	5,085	14,466
	DISUSED HEADS OR BANJARS, &c.																
1	Old Head Matithal Canal ...	168	221	42	18	118	96	...	...	...	38	301	167	224	640	305	1,169
2	,, ,, Khadal ,, ...	...	...	...	1	19	48	...	...	...	...	1	...	1	20	48	69
3	,, ,, ,, ,, ...	...	...	...	4	29	7	...	...	...	...	14	12	4	43	19	66
4	,, ,, Shahpur ,, ...	...	1	2	...	...	12	...	...	...	...	...	3	...	1	17	18
5	,, ,, Wali Mohamed Vigar...	2	1	...	2	15	33	...	...	...	1	30	24	5	46	57	108
6	,, ,, ,, (Jhok Bason) ...	5	7	7	...	3	...	...	...	...	...	...	...	5	10	7	22
7	,, ,, Sikandarabad ...	...	...	...	...	8	63	...	...	...	...	3	33	...	11	96	107
8	,, ,, ,, Bhangiwala ...	21	14	10	1	5	9	...	...	...	22	71	347	44	90	366	500
9	,, ,, Gajjuhatta	6	23	3	...	14	9	...	...	...	3	28	36	9	65	48	122
10	,, ,, Bakhtuwah	...	2	2	1	62	166	...	...	...	...	1	...	1	65	168	234
11	,, ,, with old Bund ...	21	11	21	212	1,185	900	...	...	...	24	135	72	257	1,331	993	2,581
	Total Banjar or old Heads ...	223	280	87	239	1,458	1,343	...	...	...	88	584	694	550	2,322	2,124	4,996
	Chenab Bund	2	162	1,313	3	342	1,807	...	...	...	3	173	833	8	677	3,953	4,638
	CHAUKI COMPOUNDS.																
1	Chauki at Bindu Sargana ...	...	...	211	...	3	40	...	...	...	...	1	24	...	4	275	279
2	,, Khanpur Mailsi ...	1	80	45	...	19	52	...	...	...	...	2	30	1	101	127	229
3	,, Qasba...	...	2	60	1	4	49	...	...	...	...	1	10	1	7	119	127
4	,, Buch...	1	44	32	2	30	228	...	...	1	4	29	10	7	103	271	381
5	,, Shujabad	...	...	13	2	19	10	...	...	...	4	39	14	6	58	37	101
6	,, Satjurgie	...	18	117	3	3	6	...	...	...	13	72	110	16	93	233	342
7	Godown at Mooltan	1	62	54	...	3	46	...	...	1	2	15	11	3	80	112	195
	Total Chauki Compound ...	3	206	532	8	81	431	...	...	2	23	159	209	34	446	1,174	1,654
	GRAND TOTAL ...	3,615	6,408	4,784	1,174	8,654	10,333	59	236	149	1,198	13,337	11,726	6,046	28,635	26,992	61,673

LOWER SUTLEJ AND CHENAB DIVISION I. CANALS.—*(Continued).*

TABLE V. A.—Number of Trees at the close of 1883-84.

No.	Name of Canal.	Number of Trees.															Grand Total.
		Sissu.			Kikar.			Mangos.			Other kinds.						
		Class.			Class.			Class.			Class.			Class.			
		1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2 nd.	3rd.	
	SUTLEJ SUB-DIVISION.																
	Main Canals.																
1	Diwanwah M.	1	6	4	25	814	933	...	...	...	22	627	1,064	48	1,447	2,001	3,496
2	Jamwah Khurd	2	31	75	38	350	431	...	...	...	34	1,067	4,097	74	1,448	4,603	6,125
3	Chattarwah	...	...	...	112	117	279	...	...	...	178	1,400	1,400	290	1,517	1,679	3,486
4	Jamwah Kalan	...	...	12	201	806	583	...	...	...	414	2,677	2,445	615	3,483	3,040	7,138
5	Kabilwah	...	...	4	161	723	657	...	...	...	77	889	695	238	1,612	1,356	3,216
6	Sadikwah	...	...	...	29	238	263	...	...	...	26	2,794	544	55	3,032	807	3,894
7	Bhawalwah M.	...	5	18	188	798	634	...	...	...	392	2,926	4,220	581	3,729	4,872	9,182
8	Sultanwah	5	23	20	27	86	808	...	...	...	177	657	3,978	209	766	4,806	5,781
9	Abbanwah	...	...	...	14	58	91	...	...	...	21	108	721	35	166	812	1,013
10	Jamraniwah	2	6	17	34	66	712	...	...	...	23	101	1,814	59	173	2,543	2,775
11	Mahomedwah	4	3	13	60	375	639	...	4	2	159	706	2,260	223	1,088	2,914	4,225
12	Sirdarwah	201	258	300	100	810	769	1	...	...	152	1,394	1,490	453	2,462	2,559	5,474
13	Bhawalwah Lodhran	1	...	2	6	118	102	...	...	...	92	686	3,031	99	804	3,135	4,038
14	Sheikhwah Sharkia	2	13	5	10	73	102	...	...	...	24	231	318	36	317	425	778
15	Mubarikwah	4	6	1	6	46	117	...	...	...	223	1,102	3,444	233	1,154	3,562	4,949
16	Khanwah	1	1	2	2	14	35	...	2	5	163	420	4,313	166	437	4,355	4,958
17	Sheikhwah Gharbia	...	...	15	...	...	2	...	...	...	2	4	1,965	2	4	1,982	1,988
18	Hafizwah	...	...	...	19	91	209	...	...	...	45	485	2,923	64	576	3,132	3,772
19	Bahadurwah	...	...	...	4	18	28	...	...	...	9	122	491	13	140	519	672
	Total Main Canals ...	223	352	488	1,036	5,601	7,394	1	6	7	2,233	18,396	41,213	3,493	24,355	49,102	76,950

	BRANCHES OR SIRKARI LARHS.																	
1	Sultanwah Branch	...	...	...	...	8	16	...	...	...	2	72	502	2	80	518	600
2	Larh Chattarwah	...	...	...	224	213	111	...	...	...	131	152	162	355	365	273	993
3	,, Dilawarwah	...	...	...	147	451	789	...	...	...	78	511	477	225	962	1,266	2,453
4	,, Now Kabilwah	...	...	...	4	5	26	...	...	...	50	196	111	54	201	137	392
5	,, Uchhalwah	...	...	...	15	93	146	...	...	...	15	1,743	162	30	1,836	308	2,174
6	,, Biradarwah	3	13	6	...	77	12	...	...	...	26	272	262	29	362	280	671
7	,, Lazarwah	2	...	19	...	2	29	...	...	...	...	8	236	2	10	284	296
8	,, Bihishti	11	33	76	...	24	22	...	...	...	...	7	89	11	64	187	262
9	,, Kadirwah	...	...	...	...	9	19	...	...	...	...	38	100	...	47	119	166
10	,, Jamni	...	8	5	...	14	26	...	...	...	1	16	39	1	38	70	109
11	,, Aliwah	1	11	10	1	13	20	...	...	...	10	77	111	12	101	141	254
	Total Branches ...	17	65	116	391	909	1,216	...	...	...	313	3,092	2,251	721	4,066	3,583	8,370
	DISUSED HEADS OR BANJARS.																	
1	Dholluwalla	...	...	...	...	12	...	...	...	...	...	4	12	...	16	12	28
2	Khanpurwala	...	1	10	10	87	99	...	...	...	28	340	504	38	428	613	1,079
3	Siprewalla	...	...	....	...	...	...	...	...	...	...	5	16	...	5	16	21
4	Chatterwah	...	...	...	8	9	3	...	...	...	72	106	274	80	115	227	472
5	Ditto	1	2	14	...	100	19	...	...	...	5	30	60	6	132	93	231
6	Shahpur	...	...	...	131	127	178	...	...	...	146	867	264	277	994	442	1,713
7	Do. Saru	...	...	...	96	70	30	...	...	...	125	700	1,000	221	770	1,030	2,021
8	Banjar Kabilwah	...	...		14	72	94	...	...	...	16	80	112	30	152	206	388
9	,, Bhawalwah	...	...	...	...	4	19	...	...	...	...	300	139	...	304	158	462
10	,, Kohna Sultanwah ...	...	...	...	36	139	325	...	...	...	59	1,588	509	95	1,727	834	2,656
11	,, Sani ,, ...	...	1	1	20	38	66	...	...	...	153	802	510	173	841	577	1,591
12	,, Abhanwah	...	...	...	4	7	26	...	...	...	7	26	49	11	33	75	119
13	,, Aibakwah	...	...	...	...	...	12	...	...	...	25	41	44	25	41	56	122
14	Ditto	...	...	...	...	6	2	...	...	...	...	1	12	...	7	14	21
15	,, Kohna	...	4	...	20	74	152	...	...	...	43	177	392	63	255	544	862
16	,, Ditto	...	...	...	9	35	37	...	...	...	45	112	96	54	147	133	334
17	,, Jamraniwah	...	...	...	11	22	230	...	...	...	61	168	671	72	190	901	1,163
18	,, Tibbiwaddanwah ...	...	...	...	...	5	3	...	...	...	22	113	144	22	118	147	287
19	,, Jassuwala	...	7	28	40	101	170	...	...	...	75	321	512	115	429	710	1,254
20	,, Shahpurwalla	...	...	...	3	18	12	...	...	...	5	209	120	8	227	132	367
21	,, Jassuwalla	...	...	...	...	4	1	...	...	...	1	1	1	1	5	2	8
22	,, Aniwahan	...	...	...	1	11	16	...	...	...	7	52	44	8	63	60	131
23	,, ,, Kohna ...	...	...	...	...	4	...	...	...	...	...	12	16	...	16	16	32
24	,, ,, Another ...	...	...	...	...	1	...	...	...	...	...	2	5	...	3	5	8
25	,, Salamalmal Wah ...	...	...	...	...	...	10	...	...	...	...	...	6	...	...	16	16
26	,, Kotla Moradahwah ...	8	25	9	...	27	29	...	...	...	3	42	15	11	94	53	158
27	,, Golanwala Kohna ...	...	...	...	3	2	85	...	...	...	...	12	8	3	14	93	110
28	,, Binoranwalla	...	...	...	...	12	55	...	...	...	8	80	2,542	8	92	2,597	2,697
29	,, Dera Lakhewala ...	...	3	...	3	52	1	...	...	...	9	66	1,231	12	121	1,232	1,365
30	,, ,, Sani	...	...	...	...	...	...	...	...	...	...	4	63	...	4	63	67

LOWER SUTLEJ AND CHENAB DIVISION I. CANALS.—(*Concluded*).

TABLE V. A.—Number of Trees at the close of 1883-84.

No.	Name of Canal.	Number of Trees.															Grand Total.
		Sissu.			Kikar.			Mangos.			Other Kinds.						
		Class.			Class.			Class.			Class.			Class.			
		1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	
31	Banjar Bhagthanwala ...	...	...	...	...	5	...	...	...	...	...	...	268	...	5	268	273
32	„ Kajlawala ...	...	...	...	...	...	30	...	...	...	...	10	496	...	10	526	536
33	„ Mubarikwah ...	...	...	...	...	2	31	...	...	...	8	53	335	8	55	366	429
34	„ Khanwah ...	3	3	113	1	7	96	...	...	...	27	44	3,876	31	54	4,085	4,170
	Total Disused Heads or Banjars...	12	46	175	410	1,053	1,831	...	...	...	950	6,368	14,346	1,372	7,467	16,352	25,191
	Chauki Compounds.																
1	Chauki at Ishlamki ...	...	6	38	3	48	62	...	...	...	2	7	52	5	61	152	218
2	„ Khanpur ...	...	2	6	2	46	43	...	...	...	...	10	34	2	58	83	143
3	„ Lalsaggu ...	...	1	20	...	...	19	...	...	...	...	8	181	...	9	220	229
4	„ Fattehpur ...	...	...	48	1	6	1	...	...	...	4	132	59	5	138	108	251
5	„ Kehror ...	...	24	136	...	6	34	...	...	...	6	42	105	6	72	275	353
6	„ Bassantpur ...	...	...	...	...	...	...	...	...	...	...	2	9	...	2	9	11
7	„ Haweli Nassir Khan ...	...	...	4	...	18	15	...	...	...	2	7	23	2	25	42	69
8	„ Lodhran ...	...	...	7	...	...	...	...	...	...	...	1	13	...	1	20	21
9	„ Koreshiwalla ...	...	...	40	...	7	126	...	...	...	...	9	57	...	16	223	239
10	„ Jagguwalla ...	...	2	25	...	2	46	...	...	...	...	7	77	...	11	148	159
11	„ Tibbi Vaddan ...	...	...	...	...	4	9	...	...	...	2	7	7	2	11	16	29
	Total Chauki Compounds ...	...	35	324	6	137	355	...	...	...	16	232	617	22	404	1,296	1,722
	Grand Total Sutlej Sub-Divn. ...	252	498	1,103	1,843	7,700	10,796	1	6	7	3,512	28,088	58,427	5,608	36,292	70,333	1,12,233

Abstract.																
Main Canals ...	2,204	4,461	2,899	1,582	9,875	12,213	8	138	91	2,924	27,919	48,525	6,718	42,393	63,758	1,12,869
Branches or Sarkari Larhs ...	1,423	1,716	557	769	3,408	3,119	52	104	63	706	5,990	4,929	2,950	11,218	8,668	22,836
Disused Heads or Banjars ...	235	326	262	649	2,511	3,174	...	...	...	1,038	6,952	15,040	1,922	9,789	18,476	30,187
Chauki Compounds	3	241	856	14	218	786	...	...	2	39	391	826	56	850	2,470	3,376
Chenab Bund	2	162	1,313	3	342	1,807	...	...	...	3	173	833	8	677	3,953	4,638
Total	3,867	6,906	5,887	3,017	16,354	21,129	60	242	156	4,710	41,425	70,153	11,654	64,927	97,325	1,73,906

3.—DERA GHAZI KHAN DIVISION, INDUS INUNDATION CANALS.

General remarks.—The rainfall was very small and much below the average.

Description of work.—The length of previously existing avenues is 128½ miles as given by the more exact measurement in feet this year. The length reported last year, 129 miles, being not quite exact. Of these about 4 miles were washed away by the River Indus on canals and bunds. The new length planted out this year was 7 miles—making the net total now 131½ miles, though gaps exist in many parts of these.

The number of new trees planted out were 2,359—all in the Rajanpur sub-division. Of these 1865 have been destroyed by cattle—chiefly camels,—a very heavy loss. The Sub-Divisional Officer reports that the owners are quite indifferent, and that men of good position and zaildars are often the defaulters. Much greater care will be taken in future only to plant out young trees where they can be protected. Gaps in avenues have been partly filled up. Nurseries and groves in compounds and young trees in avenues have been watered. The area under groves is the same as last reported,—42-3 acres. These have been maintained and thinned in places.

Establishment and supervision.—The special establishment consisted of 1 mate @ Rs. 8, 4 malis @ Rs. 6, about 30 bhishtis @ Rs. 5 and Rs. 6 per mensem, and 8 bullocks. The supervision was done by the Divisional and Sub-Divisional Officers and their subordinates.

Financial results.—The expenditure during the year was—

	Rs.	A.	P.
Watering groves and Nurseries	563	2	6
ditto avenue trees	1860	13	2
Planting out young trees	186	5	10
Fencing ditto	372	0	6
Pruning and thinning out trees	118	15	9
Total Rs.	3101	5	9

The receipts were—

	Rs.	A.	P.
Value of trees used for river defence works	4,355	0	0
Sale of the timber	997	11	3
do. Fuel	237	5	0
do. crops	97	0	2
do. other canal produce	191	3	10
Total	5,878	4	3

This gives a surplus of Rs. 2,776-14-6, due, however, only to the extraordinary item of trees used for the river defence works. This was a special case, and such an amount is not likely to be realized again soon. Leaving this item out, the result would have been as usual a deficit, the remainder Rs. 1,523-4-3 representing the ordinary receipts of the year. The rate for planting out trees by paid labour comes to 0-1-3 per tree. It is not known how many were fenced. The pruning and thinning out was not done by contract, and no estimate was made of the quantity of fuel obtained; but the amount realized from the sales of part was in excess of the expenditure incurred.

The number of trees planted out and no longer requiring watering or further expenditure is about 34,000; about 24,000 others are being looked after and watered.

The total expenditure in this division has been about Rs. 60,495 since operations were commenced about 21 years ago, and the total receipts Rs. 22,145, chiefly, however, for self-sown trees, on which no expenditure has been incurred, so that most of the expenditure has not yet begun to bring in any return. Taking about ¾ths of the total expenditure to have been spent on the 34,000 advanced trees or Rs. 45,000, and taking compound interest at 5 per cent. on this sum for the past 10 years as an average time, the amount comes to about Rs. 75,000 or Rs. 2-2-0 per tree now. In another 20 years, when these trees will be full grown, the compound interest would amount to about Rs. 195,000, or Rs. 5-8-0 per tree. As 81 per cent. are shisham, this is much below their market value, and the expenditure would then bring in a good return. But before the expiry of this period much will have been realized from sales, thus in practice reducing the amount as found above. In fact a beginning has already been made, the Rs. 4,355 realized this year for sales to river defence works are all for planted-out trees.

MUZAFFARGARH DIVISION, INUNDATION CANALS.

General remarks.—The operations during the year have been entirely confined to maintaining existing plantations. A count of trees in plantations was taken during April and May, and a table shewing the number of trees of different kinds, classified according to girth, is attached. As the plantations in this division are all of recent date, all the trees come under

class III. A statement showing lengths of avenues in the prescribed form is also forwarded. The total length of the Government channels in this district, including main canals and branches, is about 1,100 miles. No count has yet been taken of the old existing trees on these channels, but as the channels are not absolutely property of Government, it does not seem advisable to take count of the old trees. As soon as a channel is abandoned it is made over to the people in whose land it happens to be situated. A charge, however, is generally made for the trees on it.

Description of work.—The only work done was watering, watching and protecting the trees in existing plantations, and for this purpose Malis and Beldars were employed.

The expenditure and receipts for the year are shewn below—

Receipts.	Rs.	A.	P.	*Expenditure.*	Rs.	A.	P.
Sale of wood	... 690	10	9	Paharpur plantation	... 50	10	0
Sale of Lung and Sarkana	... 1,640	0	0	Kerari do.	... 81	15	5
Sale of Fruit	... 60	0	0	Kot Ratta do.	... 261	0	3
				Wali Wab do.	... 117	0	0
Total	... 2,390	10	9	Total	... 510	9	8

It must, however, be remarked that the receipts are realized from the sale of wood, fruits, &c., of the trees of which no count has ever been taken, and hence they are not included in the statements accompanying the report. The expenditure is incurred in maintaining the plantations mentioned above, and which have been established within the last few years and from which no return has as yet been obtained.

MUZAFFARGARH CANALS DIVISION.

Table V. A.—Number of trees at the close of year 1883-84.

	Number of trees.																		Grand total.	Bamboo clumps.	Remarks.
	Sissu.			Kikar.			Tun.			Mango.			Other kinds.			Class.					
	Class			Class			Class			Class			Class								
	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.	1st.	2nd.	3rd.			
Main Canal	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Branches.																					
Wali wah	...	...	932	...	...	13	...	...	...	...	...	2	...	...	107	...	...	1054	1054	...	
Ratan wah	...	...	379	...	...	139	...	...	..	...	...	...	...	...	93	...	...	611	611	...	
Distributaries.																					
Kot Ratta Bund	...	...	896	...	...	197	...	...	...	...	...	...	...	...	191	...	...	1284	1284		
Separate plantations.																					
Kirari wali, 6 Acres	...	...	784	...	...	...	...	...	....	...	...	9	...	...	39	...	...	832	832		
Paharpur, 2 Acres	...	...	58	...	...	...	...	...	...	...	...	...	...	...	110	...	...	168	168		
Total ...	...	...	3049	...	...	349	...	...	...	...	...	11	...	...	540	...	...	3949	3949	...	

5. SIRHIND CANAL DIVISIONS.

Financial Results.

Table I.—Profit and Loss by Divisions and Branches.

Division.	Branch.	Maintenance P. Allotted.	Spent.	Receipts.	Loss.	Profit.	From Commencement. Expenditure.	Receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
3rd...	Main Line	6,880	5,634	7,116	...	1,482	18,497	9,282
	Comb. Bch.... ...	300	46	...	46	...	185	...
	Bhatinda ditto ...	7,090	6,285	19	6,266	...	12,175	661
	Abohar 0-48... ...	4,460	4,245	599	3,645	...	16,763	2,874
	Total 3rd Division...	18,730	16,210	7,734	9,957	1,482	47,620	12,817
4th ...	Abohar 48-126 ...	6,000	6,668	4	6,664	...	7,250	4
	Sutlej Nav. Ch. ...	2,500	2,448	323	2,125	...	3,734	331
	Total 4th Division...	8,500	9,116	327	8,789	...	10,984	335
5th ...	Feeders	5,300	4,198	423	3,775	...	7,934	703
	Kotla Bch.	2,000	1,597	474	1,123	...	2,614	654
	Guggar ditto ...	1,000	614	406	208	...	8,096	1,078
	Choa...	700	428	8	422	...	968	16
	Pattiala N. C. ...	1,410	1,361	...	1,361	...	3,250	8
	Total 5th Division ...	10,410	8,198	1,311	6,889	...	22,862	2,459
	Grand Total	37,640	33,524	9,372	25,635	1,482	81,466	15,611

Table II.—Detail of Receipts.

Division.	Branch.	Timber.	Grass.	Fuel.	Fruits.	Thinning.	Total.
			Rs.	Rs.	Rs.	Rs.	Rs.
3rd ...	Main Line	...	2,726	2,825	1	1,564	7,116
	Comb. Br.	...	...	...	...	...	...
	Bhatinda ditto ...	...	17	...	...	2	19
	Abohar ditto ...	...	598	...	...	1	599
	Total 3rd Division ...	...	3,341	2,825	1	1,567	7,734
4th ...	Abohar Br. ...	...	4	...	...	...	4
	Sutlej Nav. Ch. ...	...	78	...	...	245	323
	Total 4th Division ...	...	82	...	...	245	327
5th ...	Feeders	...	138	195	...	90	423
	Kotla Br.	...	396	15		63	474
	Guggar ditto ...	...	405	...	1	...	406
	Choa ditto ...	...	6	...	...	...	6
	P. N. Ch.	...	...	...	...	...	...
	Total 5th Division ...	...	945	210	1	153	1,309
	Grand Total... ...	...	4,368	3,035	2	1,965	9,370

Table III.—Detail of Expenditure.

Division.	Branch.	Sowing.	Nur-series.	Trans-planting.	Water-ing.	Thin-ning.	Fencing.	Conser-vancy.	Total.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
3rd ...	Main Line	1,745	600	383	...	2,788	118	...	5,634
	Comb. Br.	7	25	...	...	7	...	7	46
	Bhatin ditto ...	3,185	717	95	256	...	1,881	151	6,285
	Abohar ditto ...	2,113	810	...	...	250	1,057	15	4,245
	Total 3rd Division ...	7,050	2,152	478	256	3,045	3,056	173	16,210
4th ...	Abohar Br. ...	1,239	346	540	1,795	...	2,672	76	6,668
	Sutlej N. Chl. ...	525	...	88	689	9	1,015	122	2,448
	Total 4th Division ...	1,764	346	628	2,484	9	3,687	198	9,116
5th ...	Feeders	577	...	...	156	8	3,267	189	4,197
	Kotla Br.	314	...	...	22	...	1,033	229	1,598
	Guggar ditto ...	457	...	...	12	...	87	58	614
	Choa ditto	277	...	...	...	...	141	10	428
	Pattiala N. C. ...	157	203	...	58	...	943	...	1,361
	Total 5th Division ...	1,782	203	...	248	8	5,471	486	8,198
	Grand Total	10,596	2,701	1,106	2,988	3,062	12,214	857	33,524

2. *Profit and loss.*—There has been a net loss of Rs. 24,153, but a very fair beginning as to revenue collection has been made on the Main Line or in 3rd Division.

3. *Receipts.*—Although detailed figures cannot be given for past years for comparison, in totals, receipts have gone up as follows :—

	1882-83	1883-84	Increase.
3rd Division ...	1,359	7,734	6,375
4th „ ...	14	327	313
5th „ ...	*Nil*	1,309	1,309
Total ...			7,997

and by reference to Table II it will be seen that these receipts are mainly under grass, fuel and thinnings. Practically fuel and thinnings are one and the same, thinnings converted into charcoal having been classed as fuel.

The grass revenue is best on Main Line or in the district nearest the hills, but the reason of this is : this portion of canal has been completed for some years, whilst lower down the banks are comparatively new.

For the same reason the Main Line plantations are now yielding revenue on thinnings. From Table A, column 8, it will be seen that of the 3,447 acres covered, one-half or 1,514 are on the 58·3 miles of main canal against 1,933 on remaining 439·7 miles.

4. *Expenditure.*—Of the total 33,524 approximately one-third (or Rs. 10,596) have been spent on sowing. Another third (Rs. 12,214) on fencing and remainder on conservancy, thinning and tending.

And by Divisions one-half or Rs. 16,210 has been expended by 3rd Division, whilst the spending powers of 4th and 5th Divisions are represented by Rs. 9,116 and 8,198.

5. The areas sown from Table A and charges from Table III are as follows :—

	Areas sown in acres.	Cost. Rs.	
Main Line	521 ...	1,745	
Combined Bchs.	... ...	7	
Bhatinda Branch	644 ...	3,185	
Abohar „	....	2,113	
Total 3rd Division	1,165 ...	7,050	or Rs. 6 per 100 acres.
Abohar Branch	85 ...	1,239	
Sutlej Navgn. Chl.	100 ...	525	
Total 4th Division	185 ...	1,764	or 9·5 „
Feeder	66 ...	577	
Kotla Branch...	103 ...	314	
Guggar „	38 ...	457	
Choa „	37 ...	277	
P. N. Channel	34 ...	157	
Total 5th Division	278 ...	1,782	or 6·4 „

There is some error about the 3rd Division, Abohar Branch, as Rs. 2,113 has been expended without any work done. The average rate per acre is very high, since Rs. 2 per acre ought to suffice.

6. Under thinning Rs. 2,788 were expended on Main Line, and for this sum 91·250 cubic feet were stacked or at a rate of Rs. 12-2 per 100 maunds of 400 c. ft. An exceedingly high rate and enquiry is being made into the matter.

Of the 91·250 c. ft. 58·000 c. ft. were turned into 23·186 c. ft. or 5,152·5 mds. of charcoal valued at 0-13-6 per md. or Rs. 4,347. The charcoal was used on canal works, and the value rate 0-13-6 assessed somewhat below bazar rates.

24,000 c. ft. of the thinnings were sold as fuel at the rate of Rs. 20 per 100 mds., so that net profit to plantations was at the rate of Rs. 20-12-2=Rs. 7-8 per 100 mds.

7. Grass brought in Rs. 4,367, and the acreage and rates were as follows :—

	Rupees.	Acreage.	Rate per 100 acres.
Main Line	2,726	3,166	86·1
Comb. Bchs.	...	60	...
Bhatinda Br.	17	1,850	·9
Abohar „	598	1,100	54·4
Total 3rd Division ...	3,341	6,176	54·1
Abohar Branch	4	1,814	·2
Sutlej N. Chl.	78	1,000	7·8
Total 4th Division ...	82	2,814	2·9
Feeder	138	745	18·4
Kotla Br.	396	1,541	25·7
Guggar „	405	1,260	32·1
Choa „	6	241	·2
P. N. Chl.	...	83	...
Total 5th Division ...	945	3,870	24·4
Grand total	4,368	12,860	34·0

The result is far better than 1882-3, when practically no attempts were made to sell the grass.

8. The count of trees made in April resulted as follows :---

First class trees being over 6′ in girth at 4′ from ground.
Second „ „ „ 3′ „ but under 6′ „ „
Third „ „ „ 1′ „ „ „ 3′ „ „

Under 1′ in girth classed as seedlings.

	1st class.	2nd class	3rd class.	Total.	Seedlings in acres.
Main Line	26	2,542	42,981	45,549	1,068
Comb. Br.	...	32	439	471	10
Bhatinda „	...	34	2,017	2,051	100
Abohar „	9	2,681	18,541	21,231	550
Total 3rd Division ...	35	5,289	63,978	69,302	1,728
Abohar Br.	57	102	301	460	22
S. N. Chl.	...	12	2,650	2,662	197
Rajbahas	2	9	34	45	...
Total 4th Division	59	123	2,985	3,167	219
Feeders	5	293	16,567	16,865	79
Kotla Br.	49	147	9,529	9,725	324
Guggar „	29	240	16,753	17,022	82
Choa „	1	37	281	319	...
P. N. Chl.	4	132	3,275	3,411	12
Total 5th Division ...	88	849	46,405	47,342	497
Grand total ...	182	6,261	1,13,368	1,19,811	2,444

9. The rainfall of the year was up to the average, but it was unequally distributed, or with long hot breaks between heavy falls. The heaviest fall occurred in September. Sowings therefore were not generally successful.

Statement of fencing for the year 1883-84.

1	2	3	4	5	6	7	8
District.	Canal branch or drainage.	Length of canal branch or drainage miles of 5,000'.	Length of wire fence existing according to last year's return in miles.	Length planted during the year.	Length existing at end of year.	Class of fence.	Remarks.
Umballa	Main Line Canal ...	39·0	...	...	...	...	
Patiala	,, Chamkour escape...	3·6	...	...	...	...	None required.
Ludhiana	,, Banks of torrents ...	15·7	...	...	...	...	Do.
	Total ...	58·3	*Nil.*	*Nil.*	*Nil.*		
Ludhiana	Combined Branch ...	2·2	..	...	...		
	Total ...	2·2	*Nil.*	*Nil.*	*Nil.*		
Ludhiana	Bhuttinda Branch 0—13	13·0	...	1·0	1·0	Aloe ...	On one bank only.
Pattiala	,, ,, 13—38	25·0	...	9·0	9·0	Do.	Do.
Nabha	,, ,, 38—62	24·0	...	2·0	2·0	Do.	Do.
Ferozepore	,, ,, 62—80	18·0	...	*Nil.*	*Nil.*		
	Total ...	80·0	*Nil.*	12·0	12·0		
...	Abohar Branch 0—8	8·0	...	*Nil.*	...		
Ludhiana	,, 8—32	23·4	...	*Nil.*	...	...	1·25 miles wire erected for protection of aloes to be planted.
Ferozepore	,, 32—48	16·6	...	6·0	...	Aloe ...	Aloes planted, but 3 miles died and 3 miles removed to give place to a Rajbuha.
	Total ...	48·0	*Nil.*	6·0	*Nil.*		
Ferozepore	,, 48—75	27·0					
Faridkote	,, 75—102	25·0	...	6·5	6·5	...	Wire fencing also erected 3·5 miles on one bank only and 1·5 miles both banks.
Sirsa	,, 102—126	22·9					
	Total ...	74·9	*Nil.*	6·5	6·5		
...	Sutlej Nav. Chl. 0—22	22·0					
Ferozepore	,, 22—48	25·2	...	4·0	4·0	...	Aloe & wire fencing on one bank only.
	Total ...	47·2	*Nil.*	4·0	4·0		
Pattiala	Feeder 0—20	20·9					
Nabha	,, 20—40	19·9	...	5·0	0·3	Aloes & Phulai.	Phulai all died.
	Total ...	39·9	*Nil.*	5·0	0·3		
...	Kotla Branch 0—17	17·0					
Pattiala	,, 17—37	20·0	...	10·0	*Nil.*	Phulai	Do.
Nabha	,, 37—60	23·0					
	Total ...	60·0	*Nil.*	10·0	*Nil.*		
Pattiala	Guggur Branch 0—24	24·0					
Jhindh	,, 24—54	29·3	...	4·0	...		
Nabha	...	...	...	...	...		
	Total ...	53·3	*Nil.*	4·0	*Nil.*		
Umballa	Choa Branch ...	24·9	...	*Nil.*	...		
Pattiala	...	...	...	...	...		
Jhindh	...	...	...	...	...		
	Total ...	24·9	*Nil.*	*Nil.*	*Nil.*		
Pattiala ...	Pattiala N. Chl. ...	6·3	...	2·0	1·0	Aloe ...	Many gaps, reducing total length to 1·0 existing.
	Total ...	6·3	*Nil.*	2·0	1·0		
	Grand Total ...	49·5	*Nil.*	49·5	23·8		

WESTERN JUMNA CANAL.

1. In accordance with orders from Government of India conveyed in Joint Secretary's Circular No. $\frac{64}{1949}$ I, dated 28th March 1884, a count has been recently made of all the trees in this circle, in accordance with the classification noted in margin. The results are given in the appended Form V A. As this is the first enumeration there are no previous data with which it may be compared, but the count will in future be made every year, and if carefully conducted will perhaps afford the best indication of the growth or deterioration of the plantations on this canal. The most noteworthy fact brought out by the enumeration is the small proportion of 3rd class trees on the old lines of canal. The banks present few areas on which sowing or planting operations can be undertaken on a considerable scale as they are all more or less under plantation, and the bare plots are very small and detached. Moreover the growth of all the young trees is prevented by the depredation of the monkeys, against which there appears to be no effective remedy short of their extermination. Some effort must, however, be made to replant portions of these old banks, and to increase the number of young trees.

Class I. 6 feet & over in girth.
Class II. 6 to 3 feet in girth.
Class III. 3 to 1 foot in girth.

2. The details of receipts and expenditure are as follows :—

RECEIPTS.

Item.	Karnal Division.	Hansi Division.	Delhi Division.	Total.
Sale of Fuel	713	5,308	3,778	9,799
,, Timber	...	3,696	2,614	6,310
,, Fruit	788	107	1,250	2,145
,, Grass	183	...	423	615
Grazing leases	2,161	...	...	2,161
Miscellaneous	...	46	28	74
Total ...	3,845	9,157	8,102	21,104

EXPENDITURE.

Item.	Karnal Division.	Hansi Division.	Delhi Division.	Total.
Planting	...	75	...	75
Carriage of timber, &c.,...	...	636	...	636
Maintenance	616	1,871	1,126	3,613
Miscellaneous	154	214	...	368
Total ...	770	2,796	1,126	4,692

The profit during the year therefore amounted to Rs. 16,412, against Rs. 13,270 in 1882-83. There were no receipts or expenditure during the year in the New Delhi Branch Division.

3. With reference to a remark in para. 29 of the Conservator's Report for 1882-83, it is to be observed that no account can be given of the capital sunk in the plantations on this canal, as it is only of late years that a separate account has been kept of plantation expenditure. A capital account has been kept for the New Main Line and Delhi and Hansi branches, but no separate account is kept of receipts by branches, and it appears almost impossible to give any useful figures in connection with the financial working of the plantations on the old canal.

4. The large receipts for grazing leases in the Karnal division are due to the considerable areas that have been rendered available for this purpose in consequence of the constant changes in the course of the main line above Karnal, and are peculiar to this Division. The general rates for standing timber are 8 annas per cubic foot for shisham and 4 annas for kikar; fuel is sold at Rs. 25 per 100 maunds.

5. In regard to expenditure the accounts have not hitherto been kept in a uniform system, or in sufficient detail to render it possible to analyse the figures.

Almost all operations are included under the general head of maintenance, which should be reserved for establishment only. The various classes of operations are, however, carried out on so small a scale, and are generally so detached that there is some difficulty in clearly shewing the cost of each. The possibility of shewing all expenditure under a few simple sub-heads, and of indicating clearly the specific work done under each, are under consideration, and will be subsequently submitted to the Conservator, for his opinion and suggestions.

6. Progress statements of avenues have been submitted with the Divisional reports, but the form is hardly suitable for the circumstances of an old canal. There are no definite lengths under avenues or without them. There are fine trees at irregular intervals along the whole length of almost every branch, and operations are confined to filling gaps. There is equal difficulty in determining the areas of groves. The statements now forwarded do not agree in any way with the figures given in para. 28 of the Conservator's report for 1882-83, but as the Divisional returns were forwarded to the Conservator and were abstracted in his office, I am unable to explain the differences. It is most difficult to lay down any uniform rule by which the areas of groves or the lengths of avenues can be determined, and the returns appear to me to be misleading. To make them really reliable, detailed surveys must be undertaken annually, and even then a great deal would depend on the intelligence and judgment of the lower subordinates to whom the work would be entrusted. The enumeration of the trees is now undertaken under the orders of the Government of India, and I think it would be advisable to do away with all other returns, so that the officers may give as much attention as possible to this statement, and do their best to render the annual accounts more and more reliable every year. This is a subject, however, upon which a separate reference will be made shortly to the Conservator.

7. In the Karnal division there was a good deal of planting out on various roads and detached areas in the neighbourhood of Dadúpur and in the various chauki compounds, in most of which the young trees are doing well. The expenditure on maintenance includes the cost of watering, generally by lift, the mango and chauki compound plantations, pruning, thinning, and other general expenditure, most of which, as in other divisions, is done by the regular beldars or by daily labor temporarily employed for the purpose.

8. In Hansi Division several nurseries have been formed during the year, with the object of raising a stock of young trees of different varieties for planting out; six nurseries were thus formed, as below :—

Mowana	¼	acre.
Jindh	1	,,
Narnondh	¼	,,
Hansi	2	,,
Hissar	¼	,,
Siswal	½	,,
Total ...	4¼	acres.

The Hansi nursery was formed by the reclamation of an old swamp, and eucalyptus is said to be doing very well there. The sowings at other places do not appear to have been very successful. A small expenditure was incurred in planting on New Hansi Branch, but the results have not been reported.

9. In the Dehli Division 22 miles of new distributaries were planted during the year. Gaps caused by fuel cutting on the banks of the canal were resown with kikar, but as there was an almost absolute failure of the rains the results has been a failure. In this Division a considerable revenue is derived from the sale of fruit, and many young trees were planted and preserved in the chauki compound. As all the various operations in progress, sowing, planting, thinning, etc, were done by the regular mali and beldár establishment, supplemented when necessary by daily labour, no account has been kept of the cost actually incurred on each. The total expenditure ammounted to Rs. 1,126.

10. Reports are submitted in the required form from New Delhi Branch Division on which, however, there have been no operations during the year. In 1879-80 11 miles of avenues were planted along a portion of the new line, and 111 acres of spoil banks were sown with kikar; 6 acres were also planted in the chauki compounds. During the following two years some expenditure was incurred in tending the young trees, but operations have since been entirely suspended, pending the admission of water in the new canal. The total expenditure incurred up to date has been Rs. 1,374 only. The kikar originally sown has done very well, but the avenue trees planted out have almost all perished.

TABLE V. A.

NUMBER OF TREES AT THE END OF 1883-84 IN WESTERN JAMNA CANAL CIRCLE.

Table V. A.—Number of Trees at the end of 1883-84 *in Western Jamna Canal Circle.*

	Number of Trees.																		Grand Total.	Bamboos in clamps.
	Sissu.			*Kikar.*			*Tun.*			*Mango.*			*Other kinds.*			*Total.*				
	Class.			Class.			Class.			Class.			Class.			Class.				
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III		
Main Canal above Indri	256	3,836	7,067	63	3,644	11,617	90	467	403	6	19	19	188	1,608	2,796	603	9,574	21,902	32,079	46
Ditto below „	560	2,141	2,354	561	6,901	1,978	39	323	435	20	106	163	1,616	2,911	6,213	2,796	12,382	11,143	26,321	42
New Main Line	4	138	2,632	99	321	63,008	...	1	2	14	6	8	21	15	389	138	481	66,039	66,658	...
Old Delhi Canal	1,806	4,152	2,500	392	1,729	857	399	1,652	924	219	832	377	4,873	12,592	11,909	7,689	20,957	16,567	45,213	166
New Delhi Branch	...	506	428	...	4,583	24,657	...	18	...	17	21	2	34	783	1,147	51	5,911	26,234	32,196	...
Rohtak Canal	1,128	7,964	7,128	364	783	915	493	1,706	1,149	53	149	179	3,325	11,697	17,736	5,363	22,299	27,167	54,829	163
Hansi Canal, Delhi Division	114	420	282	30	161	102	134	464	253	15	4	6	615	1,260	882	908	2,309	1,525	4,742	7
Do. Hansi Division	5,786	8,217	6,381	4,527	5,209	4,194	285	313	438	25	24	36	6,729	4,686	7,317	17,352	18,449	18,366	54,167	135
Do. Bahadra Branch	6,274	3,050	1,589	986	891	857	...	...	...	...	...	...	527	2,000	1,025	7,787	5,941	3,471	17,199	...
Do. Darba Branch ...	1,560	2,372	719	512	1,424	602	...	...	...	...	...	...	255	321	145	2,327	4,117	1,466	7,910	...
New Hansi Branch	...	...	1	1	10	2,257	...	...	...	...	...	...	21	64	113	24	74	2,371	2,469	...
Bala Canal	145	150	67	26	29	23	89	109	18	...	...	...	296	508	726	556	796	834	2,186	...
Butana Canal	859	2,200	3,852	563	1,150	3,421	561	846	985	66	139	137	3,370	7,302	4,032	5,419	11,637	12,427	29,483	...
Distributaries.																				
Karnal Division	1	10	58	3	242	1,805	...	...	...	...	...	...	4	12	124	8	264	1,987	2,259	...
Dehli Division	51	358	2,150	170	789	9,495	8	49	52	16	43	19	464	1,027	2,846	709	2,266	14,562	17,537	...

ESCAPES.																				
Karnal Division	99	510	121	142	1,912	1,197	28	121	21	...	...	...	36	202	70	305	2,745	1,409	4,459	...
Delhi Division	23	431	152	11	428	266	...	3	15	2	...	33	7	22	177	43	854	643	1,570	...
Najafgarh Jhil	...	28	465	23	255	1,148	...	3	94	...	...	4	10	72	381	83	358	2,092	2,483	...
Drainage Delhi Division	...	...	..	1	27	147	...	...	...	...	...	...	4	11	98	5	38	245	288	...
SEPARATE PLANTATIONS.																				
Karnal Division	94	1,311	3,458	175	3,299	11,860	54	165	83	16	129	21	134	519	1,047	473	5,423	16,469	22,365	25
Delhi Division	8	55	77	12	29	35	8	18	30	7	134	174	41	133	348	76	369	664	1,109	...
GRAND TOTAL ...	18,768	37,849	41,541	8,661	33,816	140,441	2,188	6,258	4,902	478	1,606	1,178	22,570	47,745	59,521	52,665	127,274	247,583	427,522	584

Abstract by Canal Divisions.

Karnal Division	1,014	7,946	15,690	1,043	16,319	91,465	211	1,077	944	56	260	211	1,999	5,267	10,639	4,323	30,869	118,949	154,141	113
Delhi Division	3,130	13,408	12,814	1,003	4,201	12,965	1,042	3,895	2,517	312	1,162	792	9,339	26,814	34,377	14,826	49,480	63,465	127,771	336
Hansi Division	14,624	15,989	12,609	6,615	8,713	11,354	935	1,268	1,441	93	163	173	11,198	14,881	13,358	33,465	41,014	38,935	113,414	135
New Delhi Branch Division	...	506	428	...	4,583	24,657	...	18	...	17	21	2	34	783	1,147	51	5,911	26,234	32,196	...
GRAND TOTAL ...	18,768	37,849	41,541	8,661	33,816	140,441	2,188	6,258	4,902	478	1,606	1,178	22,570	47,745	59,521	52,665	127,274	247,583	427,522	584

KARNAL DIVISION, WESTERN JAMNA CANAL.

General remarks.

District.	Rain gauge.	During year inches.	Average inches.
Amballa ...	Dadupur ...	31·28	36·30
Karnal ...	Karnal ...	15·75	24·63

Rainfall.—The table in the margin shows that the rainfall has been very much under the average of the preceding years. This has been against arboricultural profits since more than usual artificial watering had to be resorted to.

Windstorms.—In June severe gales occurred ; the storm of the 5th destroyed a large number of trees and shook off much fruit from the mango trees.

Explanation of difference in this year's opening and last year's closing totals.—The tabular statement is now in a somewhat different form to that prescribed in Punjab Government Circular Civil Department No. 7-119, dated 16th March 1881. The observance of lengths of single lines of trees in avenues has totally changed the appearance of the lengths of avenues as formerly recorded, but has not materially changed the lengths of roads or canals according to column 1. With regard to groves the great difference in total area appears to be due to some mistake in the way the plots of canal land have been taken into account, which have been shown as various, patchy, and more or less overgrown with trees. This error appears to have originated in the Conservator's office. These plots, amounting to 1370 acres, were not shown from the first as being distinctively groves.

The canal in this division is more like a river, winding and twisting about. Its banks suffer considerably from erosion, and many fine trees have frequently to be cut down to prevent them from falling into the canal. There are evidences of trees having been planted out in lines, but now nothing is done towards making good gaps along the old canal, excepting in the vicinity of Dadupur. In fact there has been little or nothing done to extending avenues during the year under report even on the new portions of the canal. The reason is that there is little money to spare for this purpose.

Species of trees cultivated.—The trees grown in the Ambala district differ to a certain extent from those grown in the Karnal district, since the former includes species peculiar to the Siwaliks tract of country. At Dadupur there are various ornamental and foreign trees, some of which have become established, and others are under experiment. The species given in column 6 are those only the cultivation of which is at present being prosecuted ; they are shown separately for each district.

Irrigation.—The method of fixing earthen pots near the roots of the young plants has been continued this year in the case of chauki compound plantations.

Description of work. Jaidhari road.—The portion of the road that passes through Kalsia territory has been handed over to the State authorities. On the remaining portion fourteen vacancies in the avenue lines were made good by planting out 8 kattals, 5 tuns, and 1 tut. These were planted in July, and fenced and watered. During the winter they were thatched over. These young trees have all prospered.

Along the new Jaidhar cut boundary a line of young trees was set out in November, consisting of 27 shishams and 10 tuns. These received the usual treatment, and have all, so far, prospered, though planted so late in the season.

Dadupur Kharwan and circular road.—In the last two years extensive replacement of failures has been effected, especially on the circular road. Hence there are a large number of very young trees on these avenues. In July 1883 seventy-two new trees (35 shisham, 22 tuts and 15 kattals) were planted out to fill vacant spaces. There were forty-eight deaths during the year. Of this number twenty-four were reported before July, from which it is inferred they were the former year's plants, hence 67 per cent. are successful this season. The Circular Road is on high sandy ground, far from water, exposed to high winds and sand drifts. It is a difficult avenue to raise or maintain, but a very desirable one, as it arrests the encroaches of the drift-sand from the old bed of the Som torrent.

Abdullapur Chauki approach avenue.—This was formed last year and has so far been a great success.

Som plantations above Dadupur.—The spoil from the silt clearance of the mouth of the Som encroached on the shisham plantation to a certain extent. The young trees generally are in flourishing condition on the south side of the river, where to protect them from damage by cattle trespass two new ditches were dug in June. In August 58 shishams were planted out, all of which are flourishing.

Dadupur station.—Fifty new mango grafts were made in August ; five have since died : 90 per cent. are successful.

Patrala escape plantations below Dadupur.—There has been no extension of these plantations during the year under review. The two fields sowed broad-cast last year have been preserved from cattle trespass. In No. 1 a sprinkling of tuns live ; No. 2 is a failure. One of the Reana enclosures of last year has been preserved from trespass, and within it a very fine crop of self-sown shisham has sprung up. It appears shisham should have been sown in the two fields above-mentioned and not tun ; the seed of the latter is not always reliable.

Radaur Chauki compound.—Young trees do not seem to flourish in this compound. Of those planted four years ago a few stunted ones remain. A cluster of shishams exists in the low part, and it is likely this kind should be planted generally in the compound ; tun seems to fail completely.

Ramba Chauki compound.—The young trees planted last year are fairly successful. They suffer more from the fences becoming broken down by cattle than anything else : 80 per cent. are surviving.

Karnal Chauki compound.—The young avenue on the entrance road is progressing : 90 per cent. are surviving. Eight feet square fences of bamboo poles have been made use of here with success so far. The soil is hard and contains *reh*, so that a considerable amount of care is necessary in the raising of young trees, which, however, is not impossible, as the existence of one or two fine pipal trees proves.

Jani Chauki compound.—The young trees are doing well. The soil is not favourable, being hard, with small kankar in it.

Munak Chauki compound.—The young avenues and clusters suffer from the fences getting broken down. There are a great many labourers always about here engaged in manufacturing and construction operations.

Establishment and supervision.—The work is looked after by the Executive Engineers. In some cases ' malis ' are kept on all the year round ; but a good deal of work is done by ' coolies ' employed for short intervals.

Financial results.

		Rs.	A.	P			
Receipts—sale of wood ...		713	0	0			
„ „ grass ...		183	0	0			
„ „ fruit ...		788	0	0			
„ grazing leases ...		2,161	0	0			
Total ...					3,845	0	0
Charges 2 malis @ Rs. 6 per month		144	0	0			
4 beldars @ Rs. 5 „		240	0	0			
Miscellaneous labour		232	0	0			
Materials		154	0	0			
Total ...					770	0	0
Surplus ...					3,075	0	0

Progress Statement of Groves in the Karnal Division Western Jamna Canal.

The total area of Groves in the Division is 642 acres.

of canals 76 miles.

I		II	III	IV	V	VI	VII		VIII
Road or canal on which groves have been planted or are in course of construction.		Area of groves stocked with trees or established plants at the beginning of the year.	Area of groves planted during the year.	Area of groves on which cultivation has failed or on which trees or established plants have been destroyed or felled.	Area of groves stocked with trees or established plants at the end of the year.	Species of trees cultivated.			Remarks.
Name of.	Total acres.	Acres.	Acres.	Acres.	Acres.		Average.	During the year	
Tajawala	20	2	*Nil.*	*Nil*	2	Simbal Bakain ...	...	...	
Soni plantation above Dadupur	265	100	*Nil.*	*Nil*	100	Shisham, Tun.	...	...	
Dadupur Station	32	32	*Nil.*	*Nil*	32	Various ...	...	...	
Patrala Escape, Dadupur plantation ...	50	50	*Nil.*	*Nil*	50	Ditto.	...	...	
Various plots	1,370		*Nil.*	*Nil*	...	Kikar, shisham.	...	...	Patches more or less overgrown.
Abdullapur Chauki Compound	4	4	*Nil.*	*Nil*	4	Various ...	...	...	
Radaur do. do. ...	6½	4	...	...	4	Tun, shisham	...	...	
Indri do. do. ...	4	4	...	...	4	Various ...	...	...	
Ramba do. do. ...	4	4	...	...	4	Shisham ...	...	...	
Karnal new do. do. ...	5	...	2	...	2	Millingtonia	...	...	
Karnal old do. do. ...	3½	3½	...	...	3½	Shisham ...	...	...	
Jani do. do. ...	3¾	3¾	...	...	3¾	Shisham ...	...	...	
Shaikhpura do. do. ...	1	1	...	...	1	Jaman ...	...	...	
Phurlak do. do. ...	2½	2½	...	...	2½	Various ...	...	...	
Munak old do. do. ...	1	1	...	...	1	Ditto.	...	...	
Munak new do. do. ...	5	2	...	...	2	Shisham Millingtonia	...	...	
Rer do. do. ...	5½	5½	...	...	5½	Various ...	...	...	
Spoil banks N. Main Line ...	421	421	...	...	421	Kikar and shisham.	...	...	
Total ...	2,203¾	640¼	2	...	642¼	...	...	...	

8.—HANSI DIVISION, WESTERN JUMNA CANAL.

1. The figured statements in the prescribed form give the numbers and descriptions of existing trees, and shew the work done during the year.

2. Attention has been paid to the establishment of nurseries, for future planting out; and with the view of increasing the variety of trees, a large number of young trees were purchased from Saharanpur gardens, also seeds.

3. The seeds supplied turned out very badly; less than five per cent. germinating, though sown in a great variety of soils. Those only of the "mewa" and "bahera" were successful.

4. A nursery garden has been formed at Hansi where the old "Lal Dhiggi" pond had for years poisoned the atmosphere. The young eucalyptus trees flourish wonderfully here.

5. The unavoidable flooding of the canal berms between roadway and canal has caused the death of a large number of old trees, and they cannot be renewed until the present low banks have silted up to high water mark, therefore the number of standing timber trees between Safidon and Hansi may be expected to decrease for some years.

6. It will, however, be a difficult matter to renew this once magnificent belt of trees unless the extermination of the monkeys is permitted.

7. The want of a fence continues to afford facility for perpetual cattle trespass. An experiment is now being tried of leasing the banks for cattle grazing to men who are answerable for the protection of the trees within their contracts, and will for their own interest prevent the canal banks being made a common grazing ground.

8. About 9-10ths of the bamboos have seeded and died during the year.

9.—DELHI DIVISION, WESTERN JUMNA CANAL.

General remarks.—The rainfall during the year was exceptionally small, and this injuriously affected arboricultural operations in this division. This division, which includes the Delhi, Hansi and Rohtak canals, is well planted with trees of all descriptions, and affords considerable supplies of timber and fuel. Statement No. I shews the total length planted out and still available for plantation, together with the species of trees planted during the year in the several localities of this division.

Description of work.—8 miles on Rajbaha No. VIII, 2 miles on Rajbaha No. IX, 6 miles on Rajbaha, No. XII, and 6 miles on Rajbaha No. XXI.

The nurseries at the following places were maintained during the year :—

Gangatoli.
Saragthal.
Israna.
Khukrána.
Lohári.

The general dryness of the season and the prevailing hot winds affected the operations everywhere, and the mango gardens at the under-mentioned places suffered considerably :—

Saragthal.	Noltha.
Gangatoli.	Isranáh.
Chota Thána.	Rohtak.
Sardhana.	

The varieties of trees planted during the year included shisham, tún, jaman, nim, siras and tut, but owing to the scarcity of rain the result has not been altogether satisfactory.

Kikar seeds were sown in the gaps left by fuel cutting for the new works on the canal, but in consequence of the failure of rains they did not germinate.

Rajbahas.—No. IX Rajbaha and Minors: 230 young trees were planted during the year and 6,992 taken care of; 240 trees died during the year.

No. VIII Rajbaha and Branch.—834 young trees were planted during the year, and 10,194 taken care of; 15 died during the year.

Israna.

Nurseries at Israna.—434 young trees were planted during the year, and 588 were taken care of; 12 died. *Lohari*: 22 young trees were planted during the year and 122 were taken care of; 17 died. The mangos sown in 1881 were grafted and great care taken to preserve them. The dry wood was carefully cut away from the trees. The young fruit was blown down by high winds; however the proceeds of the fruit sales have been better than those of last year. The trees seem only to bear well every second year, which is due to the wetness of the subsoil owing to the proximity of the canal. The leaves of the trees dry and drop off as they do in the cold weather, shewing that the sap has not ascended properly from the roots. The trees along the Rohtak and Delhi canals, &c., were thoroughly pruned. All the dry wood was cut away and sold as timber and fuel, and young shoots on the trunks cut off.

Establishment and supervision.—Except malies and coolies at the nurseries, no special establishment was entertained for this work.

The supervision was made by the sub-overseers, sub-divisional officers and the Executive Engineer throughout the year.

Financial result.—The receipts during the year under head plantations, have been as below:—

	Rs.	A.	P.
Sale of fruit	1,250	10	0
Do. Timber	1,486	4	11
Do. Fuel	2,650	12	9
Do. Timber & Fuel mixed ...	2,255	3	4
Do. Grass	431	8	2
Do. Lac	24	0	0
Do. Reeds, &c., ...	4	0	0
Total ...	8,102	7	2
Sundry charges of maintaining plantations...	1,125	13	1
Surplus	8,976	10	1

Explanation of differences.—**Rajbaha No. VIII.*—The actual length of this Rajbaha is 46 miles, out of this 38 miles were shown as planted in last year's return; current years progress is 8 miles, making the total length 46 miles.

Rajbaha No. IX.—The actual length of this Rajbaha is 34·20 miles; 19 miles were planted up to last year and 2 miles during current year, therefore there remain 13·20 miles as unplanted, giving a total length 34·20 miles.

Rajbaha No. XII.—The actual length of this Rajbaha is 45·20 miles (exclusive of the 21 miles of the Rohtak canal, forming a part of this Rajbaha); 21 miles erroneously shown have been deducted, leaving 23 miles as newly planted. The current year's progress is 6 miles, making to end of this year 29 miles; there remain 16·20 miles only as unplanted against the total 45·20 miles of the Rajbaha.

* NOTE.—These lengths of Rajbahas include the minors belonging to them.

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